



OLIVER
TRAVEL TRAILERS

2023



LEGACY ELITE & LEGACY ELITE II

**STANDARD
FEATURES
COMPONENT MANUALS**

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STANDARD FEATURES COMPONENT MANUALS

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STANDARD COMPONENT CONTACT INFORMATION

AirXcel MAXX Fan & Bath Fan

AirXcel
3050 N. Saint Francis St., Wichita, KS 67219
Email: rvp_sales@airxcel.com
Phone: 316-832-3468



Barker Power Jacks

Barker Manufacturing
1125 Watkins Road, Battle Creek, MI 49015
Email: sales@barkermfg.com
Phone: 888-367-6978



Bulldog Collar-Lok Coupler - 7,000 lbs.

Sequent Performance Products, Inc.
47912 Halyard Drive Suite 100, Plymouth, MI 48170
Phone: 888-521-0510



Dexter Axles

Dexter Axle Corporate Headquarters
2900 Industrial Parkway East, Elkhart, IN 46516
Phone: (574) 295-7888



Domestic A/C, Thermostat, Cooktop, & Toilet

Domestic
2320 Industrial Pkwy, Elkhart, IN 46516
Email: customersupportcenter@domesticusa.com
Phone: 800-544-4881



First Alert Smoke/CO Alarm & Fire Extinguisher

BRK Brands, Inc.
1301 Joe Battle, El Paso, TX 79936
Phone: 800-323-9005



Furrion Stereo & Speakers

Furrion
52567 Independence Ct., Elkhart, IN 46514
Email: support@furrion.com
Phone: 888-354-5792



Garnet SeeLevel II Tank Monitor

Garnet US Inc
5360 Granbury Road, Granbury, TX 76049
Email: infous@garnetinstruments.co
Phone: 800-617-7384



Girard Awning

Girard Systems
1361 Calle Avanzado, San Clemente, CA 92673
Email: awningsupport@girardrv.com
Phone: 800-382-8442





Microwave

Contact Oliver Travel Trailers Technical support department for Warranty
Email: support@olivertraveltrailers.com
Phone: 888-526-3978



Isotherm Refrigerator

Indel Webasto Marine USA
3400 Gateway Drive, Unit #107, Pompano Beach, FL, 33069
Email: info@iwmmarine.com
Phone: 954-984 8448



ITC RV Fontana Exterior Shower

ITC Global Headquarters
230 East Lakewood Blvd., Holland, Michigan 49424
Email: sales@itc-us.com
Phone: 616-396-1355



Progressive Dynamics Power Converter

Progressive Dynamics, Inc.
507 Industrial Road, Marshall, MI 49068
Email: PDIWEST1@aol.com
Phone: 269-781-4241



Progressive Industries EMS-HW30C Surge Protector

Progressive Industries, Inc.
1020 Goodworth Dr., Apex, NC 27539
Email: sales@progressiveindustries.net
Phone: 919-462-8280



RV Safe LP/CO Alarm

V Safe LLC - Returns Dept
11441 Markon Dr., Garden Grove, CA 92841,
Email: CustomerService@RVSafeAlarm.com
Phone: 714-934-8512



Shurflo Water Pump & Accumulator

Pentair, Inc.
3545 Harbor Gateway South, Suite 103, Costa Mesa, CA 92626
Phone: 800-854-32187



Suburban Water Heater

Suburban Manufacturing Co.
676 Broadway Street, Dayton, TN 37321
Phone: 423-775-2131 Ext. 7107



Truma VarioHeat Furnace & CP Plus Control Panel

Truma Corp
825 East Jackson Blvd., Elkhart, IN 46516
Email: service@trumacorp.com
Phone: 855-558-7862





STANDARD COMPONENT CONTACT INFORMATION

Vizio TV

Contact Oliver Travel Trailers Technical support department for Warranty
Email: support@olivertraveltrailers.com
Phone: 888-526-3978



Wheels & Tires

Lionshead Specialty Tire & Wheel
Attn: Warranty Dept
305 Steury Ave, Goshen, IN 46528
Website: www.lionsheadtireandwheel.com
Phone: 574-533-6169





VIP 3000 POWER JACK OWNER'S INSTRUCTIONS

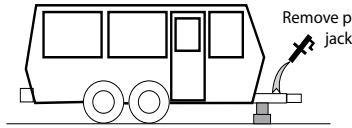
P/N 30826 (WHITE) or P/N 32453 (BLACK)

H&H Engineering VIP 3,000 Power Jack is designed to lift up to 3,000 pounds a full 18". It's design also includes a night light, built-in leveling device, attached foot plate, and an emergency crank handle. An important part of owning and using a VIP Jack is being sure it is properly installed and serviced.

GENERAL SAFETY:

Read and understand the Jack installation instructions. Always block trailer wheel when using the jack. Since there are moving parts inside the jack, be careful of loose clothing, remove or secure loose jewelry (watches, rings, etc.).

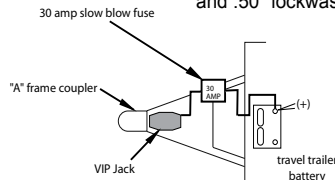
BEFORE INSTALLATION:



Raise your travel trailer's front end and place blocks or stabilizing jacks under the front "A" frame. Lower the trailer until it rests securely on stabilizing jacks or blocks. Retract present jack and remove.

INSTALLATION:

Install Jack in hole and secure with 3 bolts & 3 internal tooth lockwashers (bolt holes are threaded). The 3 bolts should already be on your trailer. The 3 internal lockwashers are supplied by us (in hardware bag). Attach the foot plate to VIP Jack with .50-20 bolt and .50" lockwasher (supplied in hardware bag).

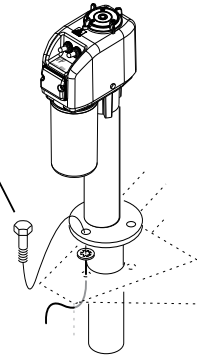


Connect the lead-wire directly to the positive (+) lead of the travel trailer's battery using a twelve (12) gage wire. Be sure the connection is a good one. THE 30 AMP SLO-BLO FUSE MUST BE INSTALLED AS SHOWN.

IMPORTANT

To insure a good electrical ground an internal tooth lockwasher must be in place for this bolt. Make sure powdercoat or paint is removed from "A" frame coupler under washer and that tagged hole is used.

The bolts should already be on your trailer.

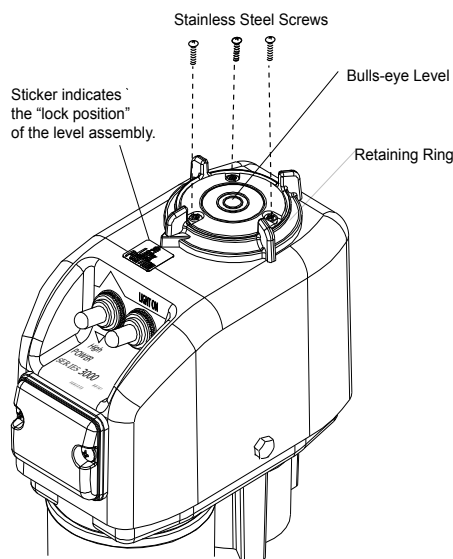


IMPORTANT NOTICE:

If it is necessary to change the position of the powerhead relative to the post and flange (in order to provide clearance between powerhead and LP gas bottle or LP gas cover, or more clearance between the lift gate and the powerhead) loosen set screws and rotate head without lifting off coupling. Retighten set screws when head is in desired position.

INITIAL SET-UP AND HOW TO USE YOUR VIP POWER JACK LEVEL:

1. Install your VIP Power Jack (SEE INSTALLATION above).
2. Place a small level inside your RV on a surface you want to level. This might be a counter top or freezer compartment of a refrigerator.
NOTE: It will be necessary to move this level to check side to side and front to back condition.
3. Check the "inside level", level your trailer from side to side with stabilizing jacks or boards under the wheels.
4. Checking the "inside level", level your trailer front to back using your VIP Power Jack.
5. Carefully adjust the 3 stainless steel screws on the ring that surround the built in bulls-eye level (see picture) until the air bubble is inside the middle circle. Your trailer will then be leveled.



In the future, you can do all your leveling by using your VIP Power Jack built-in level.

MAINTENANCE:

Once a year, the powerhead should be removed and a liberal amount of grease (preferably a grease with high melting point) applied directly to the coupling on which the drive pin rests.

DO NOT POUR OIL into top of the jack post.

Once a year, the housing cover should be removed and the gears inspected for proper lubrication. Remove 4 screws and tap around edge of housing to free cover.

DO NOT insert screw driver blade! (This may damage mating surfaces.)

Before replacing cover, clean mating surfaces. If lubrication is needed, use Mobilith 460 grease or equivalent.

barker

1125 Watkins Road / PO Box 460

Battle Creek, MI 49016

Phone: 269-965-2371 Fax: 269-965-2389

www.barkermfg.com E-Mail: service@barkermfg.com

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VIP 3000 POWER JACK OWNER'S INSTRUCTIONS

P/N 30826 (WHITE) and P/N 32453 (BLACK)

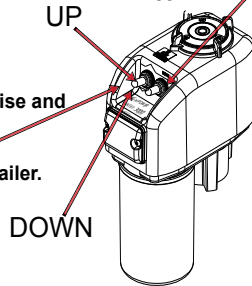
OPERATION (ELECTRIC)

REMEMBER TO KEEP HANDS AND FEET FROM UNDER THE FOOT PLATE WHEN USING POWER JACK.

When VIP Jack reaches the end of it's travel (either raising or lowering), the internal clutch activates. Dolly wheels are not recommended.

The JACK will raise and lower by this toggle switch-- NOT the travel trailer.

The "night-light" is controlled by this toggle switch



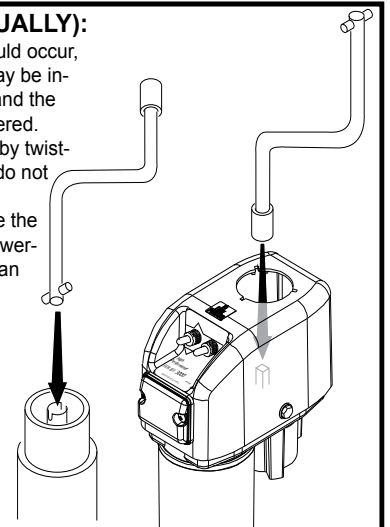
Warning

AVOID THE RISK OF INJURY OR DEATH TO YOURSELF AND OTHERS:

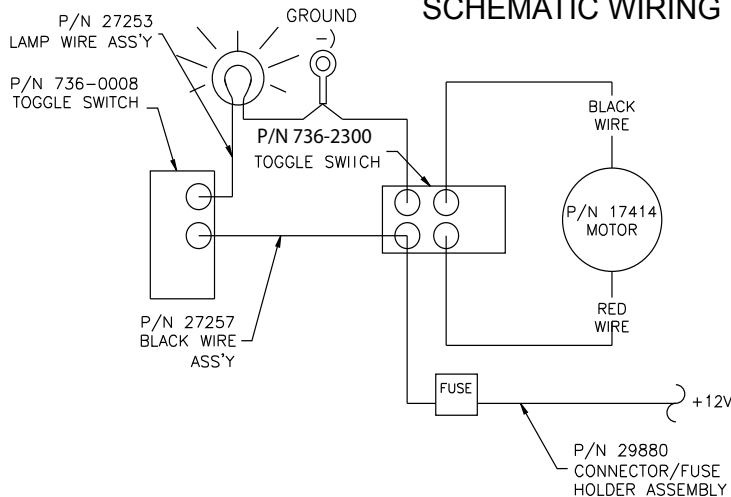
- USE THE JACK FOR LIFTING THE TRAVEL TRAILER ONLY.
- NEVER GET BENEATH THE TRAILER WHEN IT IS SUPPORTED BY THE JACK.
- SUPPORT THE VEHICLE WITH THE APPROPRIATE MEANS.

OPERATION (MANUALLY):

If an electrical failure should occur, the emergency handle may be inserted into the jack post and the jack can be raised or lowered. (Access can be obtained by twisting cap off. NOTE: You do not have to remove or loosen screws on level to remove the level assembly.) If the power-head is removed, crank can still be used to raise and lower jack.



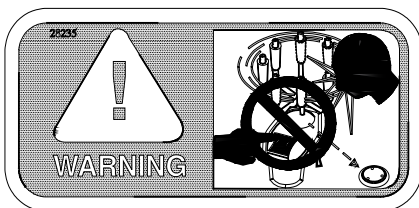
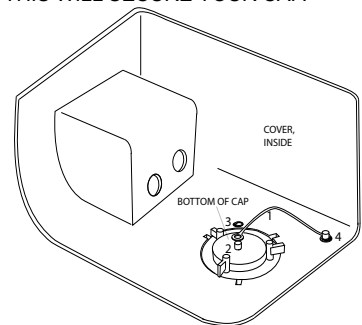
SCHEMATIC WIRING DIAGRAM



STRAP ATTACHMENT:

1. Press strap (1) onto the stud (2) at the bottom of the cap.
2. Press the retaining ring (3) on stud (2) snug it down against the strap (1).
3. Repeat this process (4) on the stud found on the inside of the cover.

THIS WILL SECURE YOUR CAP.

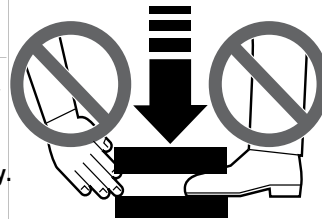


WARNING!!!

Do not use toggle switch with crank handle in place. Breaking this rule will cause serious injury or death.

WARNING

Don't risk serious injury or death in a shearing or squeezing accident. Keep body, hands, and feet away.



- REMEMBER TO KEEP HANDS AND FEET OUT FROM UNDER THE FOOT PLATE WHEN USING THE POWER JACK!!
- DOLLY WHEELS ARE NOT RECOMMENDED.

BREAKING THESE RULES WILL CAUSE SERIOUS INJURY OR DEATH.

barker

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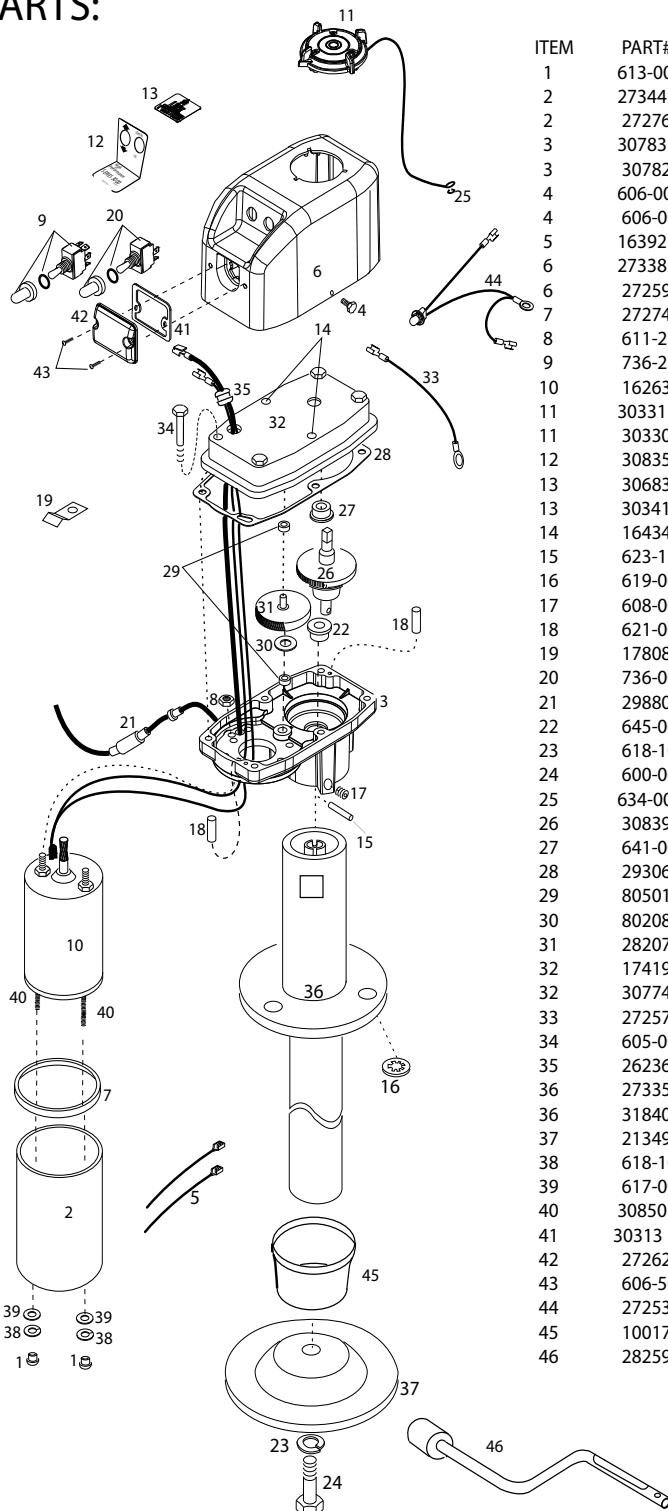
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VIP 3000 POWER JACK OWNER'S INSTRUCTIONS

P/N 30826 (WHITE) or P/N 32453 (BLACK)

PARTS:



ITEM	PART#	REQ'D	DESCRIPTION
1	613-0000	2	#10-32 ACORN NUT
2	27344	1	MOTOR SLEEVE (WHITE)
2	27276	1	MOTOR SLEEVE (BLACK)
3	30783	1	BASE FINISHED (WHITE)
3	30782	1	BASE FINISHED (BLACK)
4	606-0010	2	#10-16 X .75TEK SCREW (ZINC PLATED)
4	606-0008	2	#10-16 X .75TEK SCREW (BLACK HEAD)
5	16392	2	CABLE TIE
6	27338	1	COVER WHITE MACHINED
6	27259	1	COVER BLACK MACHINED
7	27274	1	MOTOR SEAL
8	611-2100	2	HEX LOCKNUT
9	736-2300	1	TOGGLE SWITCH
10	16263	1	MOTOR
11	30331	1	CAP ASSEMBLY- WHITE
11	30330	1	CAP ASSEMBLY- BLACK
12	30835	1	COVER LABEL
13	30683	1	LOCK INDICATOR LABEL (WHITE)
13	30341	1	LOCK INDICATOR LABEL (BLACK)
14	16434	2	HOLE PLUG
15	623-1216	1	GROOVE PIN
16	619-0003	3	LOCKWASHER INTERNAL TOOTH
17	608-0006	3	SET SCREW .313-18 X .50"
18	621-0004	2	DOWEL Ø.13" X .75
19	17808	1	WIRE CLAMP
20	736-0008	1	TOGGLE SWITCH
21	29880	1	CONNECTOR/FUSE HOLDER ASSEMBLY
22	645-0024	1	BUSHING
23	618-1002	1	LOCKWASHER .50
24	600-0011	1	HEX BOLT .50-20 X .75
25	634-0028	2	RETAINING RING
26	30839	1	TORQUE LIMITER ASSEMBLY
27	641-0009	1	BUSHING
28	29306	1	GASKET
29	80501	2	BUSHING
30	80208	1	WASHER, SPACER
31	28207	1	GEAR DRIVE ASSEMBLY
32	17419	1	COVER MACHINED
32	30774	1	COVER FINISHED (BLACK)
33	27257	1	BLACK WIRE ASSEMBLY
34	605-0012	4	SCREW
35	26236	1	RUBBER GROMMET
36	27335	1	POST ASSEMBLY BLACK
36	31840	1	POST ASS'Y-ALTERED FLANGE-BLACK
37	21349	1	BASE
38	618-1009	2	#10 SPLIT LOCKWASHER
39	617-0071	2	M5 WASHER
40	30850	2	STUD #10-32
41	30313	1	LENS GASKET
42	27262	1	LENS
43	606-5001	2	SCREW #10 X .50 PHILLIPS
44	27253	1	LAMP WIRE ASS'Y
45	10017	1	POST ADAPTER
46	28259	1	CRANK HANDLE

barker

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Bulldog Collar-Lok™ Couplers

Read, Understand, Follow and Save These Instructions

Read, understand and follow all of these instructions and warnings (Instructions) before installing and using this product. Install and use this product only as specified in these instructions. Improper installation or use of this product may result in property damage, serious injury, and/or death. Never allow installation or use of this product by anyone without providing them with these instructions. You must read, understand and follow all instructions and warnings for any product(s) to which this product is used in conjunction with or installed. Save these instructions with the product for use as a reference for any future installation and use of the product.

⚠ WARNING

Failure to follow these warnings and instructions may result in property damage, serious bodily injury, and/or death.

- Purchaser/owner must ensure that product is installed according to these instructions.
- Purchaser/owner must not alter or modify product.
- Operator and bystanders should never position any part of body under any portion of this product or the load being supported.
- Do not allow children to play on or around this product or the load being supported.
- Weigh your trailer plus added load. Do not exceed lesser of mounting bracket, coupler, hitch, vehicle, ball, or trailer weight ratings (including load).
- Never exceed maximum rated capacity. Refer to stamped markings or decals on product to obtain rated capacity. If uncertain, contact Cequent Performance Products at 1-800-632-3290 or www.cequentgroup.com
- Use only the proper ball for this coupler as indicated on the coupler body. If uncertain, contact Cequent Performance Products at 1-800-632-3290 or www.cequentgroup.com
- Always secure load, vehicle and trailer (by blocking wheels) before latching/unlatching coupler.
- Use caution when uncoupling as tongue may rise suddenly due to negative tongue load.
- After installing channel and/or coupler, if coupler operation has been impaired in any way, do not use it.

- Keep the ball pocket and mechanism clean. When parking or storing your trailer, keep the coupler off the ground so dirt and/or other foreign material will not build up in the coupler ball pocket.
- Do not tow if ball is not fully seated and/or coupler is not closed.
- All welding must be performed by a AWS certified welder.
- This product rated according to SAE J684.

Before Towing:

- Check vehicle, channel, hitch, hitch ball and coupler for signs of wear or damage and that the coupler handle opens and closes freely. If coupler and/or channel is deformed or damaged, replace complete coupler and bracket.
- Always replace bent, broken, or worn parts before using this product.
- Check that the hitch ball is fully seated in the coupler ball pocket, close coupler and insert pin behind the collar or through the latch.
- Check channel hardware for wear and proper tightness. Replace bent, broken, or worn hardware. Tighten hardware to appropriate SAE proofload specifications (See table specs). Use only grade 5 hardware.
- Make sure that the trailer safety chains are properly connected to the towing vehicle and trailer according to SAE J684.
- Make sure that all trailer lighting is hooked up and working properly.

Coupler Installation

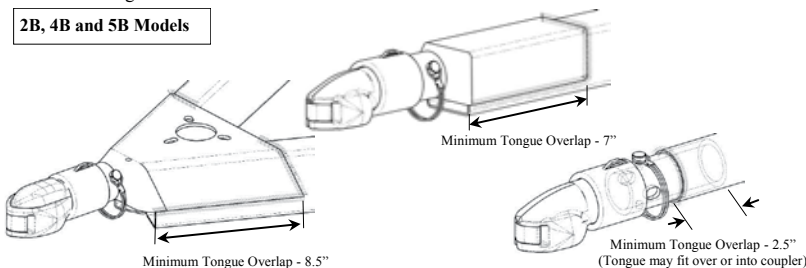
Warning: Failure to follow all installation instructions could result in coupler failure.

Before mounting the coupler confirm that there will be no interference from the tow vehicle, tongue, ground, and any other mounted accessories while stationary or in motion. Before installing, check for interference in open and closed positions. Check for interference again after installation is complete. All welding must be performed by an AWS certified welder. The coupler must be rigidly attached to the trailer in order for the coupler to support its maximum rated load according to SAE J684. After installation, check to make sure that coupler operation has not been impaired in any way. Do not use coupler if its operation has been impaired.

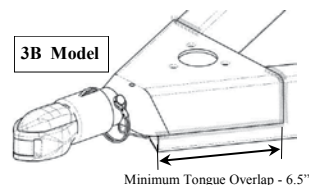
Weld-on Instructions:

- All welding must be performed by an AWS certified welder.
- Assure the coupler internal stop is butted against the end of the trailer tongue for maximum overlap.
- If using a weld-on coupler, weld 3/16" around the interface between coupler and tongue. See illustrations below. No undercut or washout while welding.

2B, 4B and 5B Models



3B Model

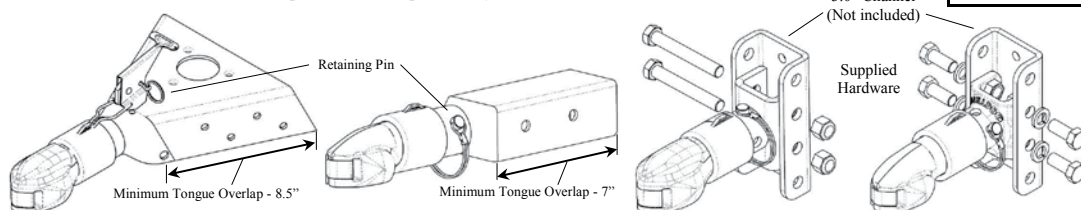


Bolt-on Instructions:

- Assure that the coupler internal stop is butted against the end of trailer tongue for maximum overlap before securing.
- Torque grade 5 bolts with locknuts to appropriate SAE proof load specifications (See table specs). No deformation of trailer tongue end allowed.
- The number and size of fasteners required must be specified by the trailer manufacturer.

Torque Specs

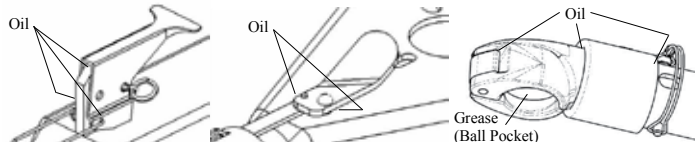
Ø 3/8"	- 23 ft.lbs.
Ø 1/2"	- 55 ft. lbs.
Ø 5/8"	- 110 ft. lbs.



Maintenance

Keep ball pocket and mechanism clean. The following procedures should be performed at least annually:

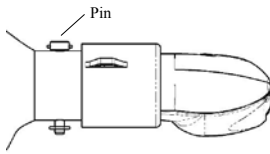
- Check welds and mounting bolt torque.
- Grease ball pocket.
- Oil pivot points with SAE 30 wt. motor oil.
- Inspect retaining pins and replace if necessary.





Operation

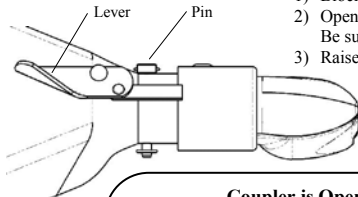
M-Style Coupler



To Couple:

- 1) Block trailer wheels.
- 2) Align hitch ball beneath coupler.
- 3) If the coupler is closed, open it by removing the pin behind the collar and sliding the collar away from the ball pocket. Be sure the coupler cap is open and holds the collar back.
- 4) Lower the trailer onto the hitch ball.
- 5) Visually check that the hitch ball is fully seated in the coupler.
- 6) After the hitch ball is seated in the coupler, carefully close the coupler cap. Be sure the collar springs toward the ball pocket and captures the coupler cap.
- 7) Reinsert the pin behind the collar. Do not tow without pin in place.
- 8) Always secure safety chains to vehicle before towing according to SAE J684.

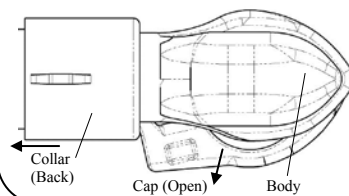
L-Style Coupler



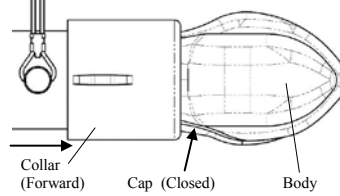
To Uncouple:

- 1) Block trailer wheels.
- 2) Open the coupler by removing the pin behind the collar and sliding the collar away from the ball pocket. Be sure the coupler cap is open and holds the collar back.
- 3) Raise the trailer from the hitch ball.

Coupler is Open Cap is Open



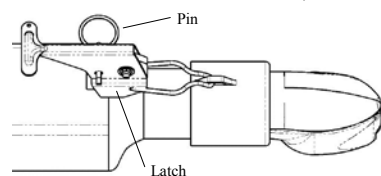
Coupler is Closed Collar is Capturing Cap



To Couple:

- 1) Block trailer wheels.
- 2) Align hitch ball beneath coupler.
- 3) If the coupler is closed, open it by removing the pin in the latch and lifting the latch. Be sure the coupler cap is open and holds the collar back.
- 4) Lower the trailer onto the hitch ball.
- 5) Visually check that the hitch ball is fully seated in the coupler.
- 6) After the hitch ball is seated in the coupler, carefully close the coupler cap and lower the latch. Be sure the collar springs toward the ball pocket and captures the coupler cap.
- 7) Reinsert the pin in the latch. Do not tow without pin in place.
- 8) Always secure safety chains to vehicle before towing according to SAE J684.

H-Style Coupler



To Uncouple:

- 1) Block trailer wheels.
- 2) Open the coupler by removing the pin in the latch and lifting the latch. Be sure the coupler cap is open and holds the collar back.
- 3) Raise the trailer from the hitch ball.

How to Order

Use only Cequent Performance Products' parts or parts of equal quality for repair. Replacement parts are available through Cequent Performance Products' Customer Service Department, 1-800-632-3290. Please specify product model number.

Limited Five Year Warranty

Limited Warranty. Cequent Performance Products, Inc. ("We" or "Us") warrants to the original consumer purchaser only ("You") that the product will be free from material defects in both material and workmanship for a period of five years, ordinary wear and tear excepted; provided that installation and use of the product is in accordance with product instructions. There are no other warranties, express or implied, including the warranty of merchantability or fitness for a particular purpose. If the product does not comply with this limited 5 year warranty, Your sole and exclusive remedy is that We will replace the product without charge to You and within a reasonable time or, at our option, refund the purchase price. This warranty is not transferable.

Limitations on the Warranty. This limited warranty does not cover: (a) normal wear and tear; (b) damage through abuse, neglect, misuse, or as a result of any accident or in any other manner; (c) damage from misapplication, overloading, or improper installation, including welds; (d) improper maintenance and repair; and (e) product alteration in any manner by anyone other than Us, with the sole exception of alterations made pursuant to product instructions and in a workmanlike manner.

Obligations of Purchaser. To make a warranty claim, contact Us at 47912 Halyard Dr. Suite 100, Plymouth, MI 48170, 1-800-632-3290, identify the product by model number, and follow the claim instructions that will be provided. Any returned product that is replaced or refunded by Us becomes our property. You will be responsible for return shipping costs. Please retain your purchase receipt to verify date of purchase and that You are the original consumer purchaser. The product and the purchase receipt must be provided to Us in order to process Your warranty claim.

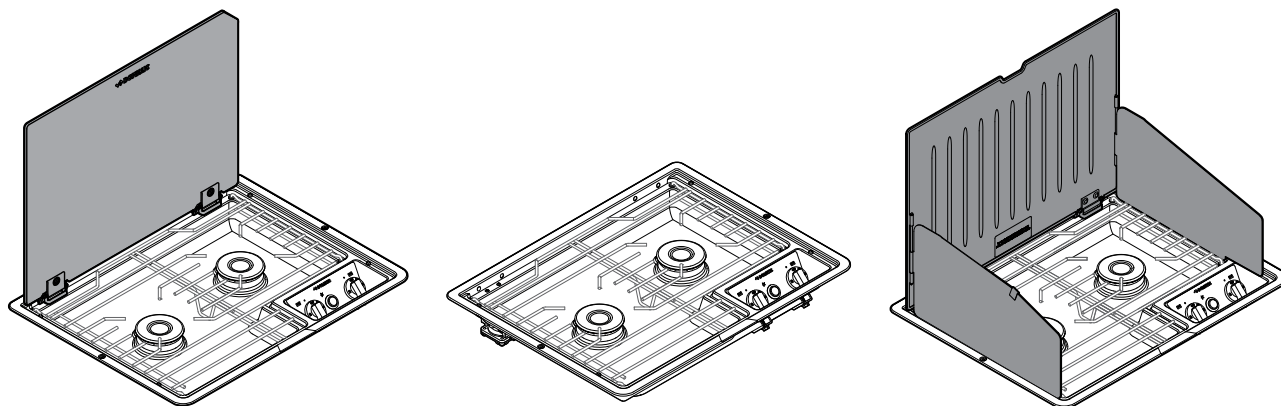
Remedy Limits. Repair or replacement is Your sole remedy under this limited warranty or any other warranty related to the product. We shall not be liable for service or labor charges incurred in removing or replacing a product or any incidental or consequential damages of any kind.

Assumption of Risk. You acknowledge and agree that any use of the product for any purpose other than the specified use(s) stated in the product instructions is at Your own risk.

Governing Law. This limited warranty gives You specific legal rights, and You also may have other rights which vary from state to state. This limited warranty is governed by the laws of the State of Michigan, without regard to rules pertaining to conflicts of law. The state courts located in Oakland County, Michigan shall have exclusive jurisdiction for any disputes relating to this warranty.



DOMETIC HOT PRODUCTS COOKTOP



D21

EN

D21 Drop-in Cooktop

Installation and Operating Manual 2

FR

Plaque de cuisson encastrable D21

Manuel d'installation et d'utilisation 14

WARNING: If the information in this manual is not followed exactly, a fire or explosion may result, causing property damage, personal injury, or death.

– Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

– WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
- Do not touch any electrical switch.
- Do not use any phone in your recreational vehicle.
- Clear the recreational vehicle of all occupants.
- Turn off the gas supply tank valve(s) or main gas supply.
- Immediately call your gas supplier for instructions.
- If you cannot reach your gas supplier, call the fire department.

– Have the gas system checked and leakage source corrected by a qualified installer, service agency, manufacturer or dealer, or the gas supplier.



NORTH AMERICAN ADDRESS INFORMATION

USA & CANADA
Service Office
Dometic Corporation
1120 North Main Street
Elkhart, IN 46514

Service Center & Dealer Locations
Visit: www.dometic.com

REVISION E | Form No. 50269 07/19 | ©2019 Dometic Corporation


Read these instructions carefully. These instructions must stay with this product.

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2	General information	4
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5	Operation	8
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1 EXPLANATION OF SYMBOLS AND SAFETY INSTRUCTIONS

This manual has safety information and instructions to help you eliminate or reduce the risk of accidents and injuries.

1.1 Recognize safety information



This is the safety alert symbol. It is used to alert you to potential physical injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

1.2 Understand signal words

A signal word will identify safety messages and property damage messages, and will indicate the degree or level of hazard seriousness.

⚠ WARNING indicates a hazardous situation that, if **not** avoided, could result in death or serious injury.

⚠ CAUTION indicates a hazardous situation that, if **not** avoided, could result in minor or moderate injury.

NOTICE is used to address practices **not** related to physical injury.



indicates additional information that is **not** related to physical injury.

1.3 Supplemental directives



Read and follow all safety information and instructions to avoid possible injury or death. Read and understand these instructions before installation, use, and maintenance of this product. Incorrect installation, operation, and maintenance of this product can lead to serious injury. The installation must comply with all applicable local or national codes, including the latest edition of the following standards:

U.S.A.

- ANSI/NFPA70, National Electrical Code (NEC)
- ANSI/NFPA 1192, Recreational Vehicles Code
- ANSI Z21.57, Recreational Vehicle Code

Canada

- CSA C22.1, Parts I & II, Canadian Electrical Code
- CSA Z240 RV Series, Recreational Vehicles

1.4 General safety messages

⚠ WARNING Failure to obey the following warnings could result in death or serious injury:

- This product must be installed by a qualified service technician.
- Dometic gas-operated cooking units are for use with LP gas only and for installation in recreational vehicles only (e.g. travel trailers, motor homes, tent campers, etc.). Any other uses can lead to property damage, serious injury, or death.
- Improper installation, adjustment, service, or maintenance can cause injury, property damage, or death. Refer to this manual. For assistance or additional information, consult a qualified installer, service agency, manufacturer, or the gas supplier.
- Do **not** store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- Shut off all gas appliances and pilot lights when refueling gasoline or LP tanks, or when the vehicle is in motion. Failure to do so can result in property damage, serious injury or death.
- Gas flames consume oxygen, which must be replaced to assure proper combustion. A window or air vent should be open slightly while using any cooking appliance. Failure to provide fresh air during combustion can lead to carbon monoxide poisoning and could result in serious injury or death.
- When the Cooktop is in use, the Cover must be fully open and in the upright position.

D21 Drop-in Cooktop

⚠ CAUTION Do not use the Cover as a griddle or cooking surface. Doing so could result in property damage or injury.

NOTICE The Cover must be closed when the vehicle is in motion.

i Have the installer or dealer show you where the main gas shut off valve is located so that you will know how and where to turn off the gas supply when necessary.

2 GENERAL INFORMATION

i The images used in this document are for reference purposes only. Components and component locations may vary according to specific product models. Measurements may vary ± 0.38 in. (10 mm).

Included Parts	Quantity
#6 x 3/4" Screws	2
(2) Nylon Washers	2
Corner Pieces	4

Recommended Tools	
Drill	3/32" Drill Bit
#2 Drive Screwdriver	Crescent Wrenches (2)

Optional Parts*	Reference Number
Metal Cover	50236
Glass Cover	50255

*The glass cover is preinstalled on the SECG model and the metal cover is preinstalled on the BPWM models. Available as an accessory for all other models.

3 INTENDED USE

This Drop-in Cooktop (hereinafter referred to as "Cooktop") is designed and intended for use inside, or for temporary use outside, the recreational vehicle (hereinafter referred to as "RV") for which it is supplied. Use these instructions to ensure correct installation, function, and operation of the Cooktop. While this Cooktop is approved for outside installation, portable or outdoor installations into an enclosure not made from metal or wood must be approved by Dometic prior to use. Do **not** store the Cooktop outdoors. This Cooktop is **not** designed for installation adjacent to another Cooktop.

The manufacturer accepts no liability for damage in the following cases:

- Faulty assembly or connection.
- Damage to the product resulting from mechanical influences and excess voltage.
- Alterations to the product without express permission from the manufacturer.
- Use for purposes other than those described in the operating manual.

Dometic Corporation reserves the right to modify appearances and specifications without notice.



4 INSTALLATION

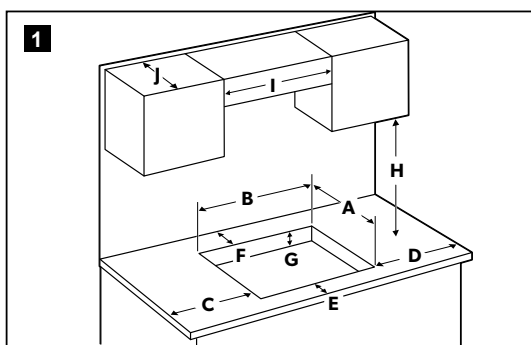
⚠ WARNING FIRE, EXPLOSION, OR BURN HAZARD. Do **not** use matches, candles, or other sources of ignition to test fittings and gas lines for leaks. Doing so could result in an explosion, causing serious injury or death.

i The gas line material between the Cooktop and the bottom shield must be rated for a minimum of 300°F (149°C) exposure.

4.1 Constructing the cabinet

For proper operation, the cabinet must:

- Be properly constructed of wood or metal, to the dimensions shown.
- Be squared to the counter top and cabinet face.
- Have the cabinet opening be level from side to side and from front to rear.
- Be positioned so that no combustible material can be placed next to the Cooktop sides. If there is a gap between the Cooktop and an adjacent cabinet, you must close the gap prior to installing the Cooktop.



A‡	B‡	C	D	E	F§	G	H†	I*	J¥
13.75" (350 mm)	17.875" (455 mm)	1.875" (48 mm)	2.25" (58 mm)	0.75" (20 mm)	2.625"/1.125" (67 mm/29 mm)	4.125" (105 mm)	19.50" (20 mm)	*	¥

‡ For proper fit, these dimensions must be within +/- 1/8" (3.2 mm).

§ 2.625" (67 mm) for all models without preinstalled cover. 1.2" (31 mm) for models with preinstalled cover (SECG and BPWM models).

† 19.50" (H) [20 mm] is the minimum vertical distance between combustible material and the Cooktop. Installer must follow requirements of table 2-6.7.2 of ANSI 1192.

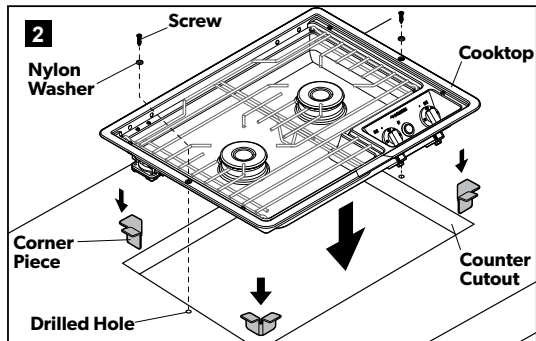
* > nominal width of the Cooktop

¥ 13.00" (J) [331 mm] is the maximum depth of cabinets installed above cooking tops per ANSI Z21.57, Clause 1.25.1.L.



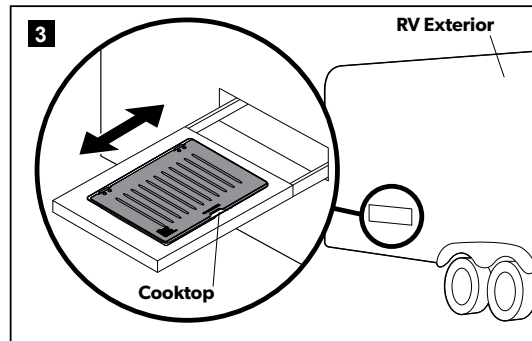
4.2 Placing your cooktop

Inside installation



- Locate and cut the opening in the countertop according to the dimensions in "4.1 Constructing the cabinet" on page 5.
- Drill holes in the countertop to match the location of the screw holes on the Cooktop.
- Place one corner piece (supplied) at each corner of the opening, so that the lip of the corner piece is flat against the countertop.
- Insert the screws and nylon washers (supplied) to install the Cooktop.
- Place the Cooktop into the opening so that it rests on top of the corner pieces. Hand-tighten the screws to the countertop.
- Verify the Cooktop is level from side to side and front to rear.
- Tighten the screws to secure the Cooktop to the countertop using a #2 screwdriver. Do **not** overtighten.

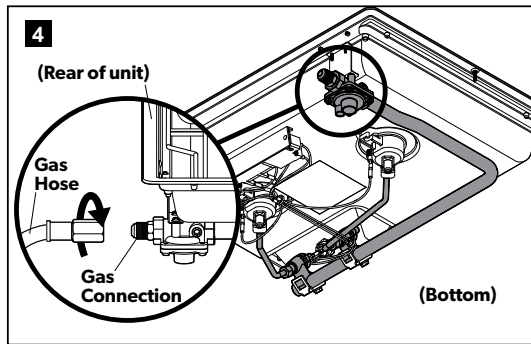
Outside installation



- i** Do **not** store the Cooktop outside.

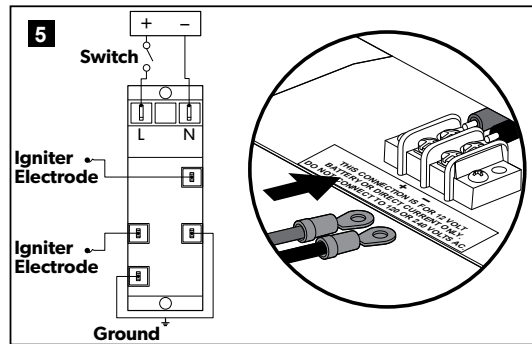


4.3 Connecting the propane gas



- Run a propane-certified hose from the propane supply tank to the gas connection on the Cooktop.
- Tighten according to appropriate RV and gas codes. Use two wrenches when tightening. Hold regulator in place while tightening hose.
- Turn ON the gas supply by turning the gas shut-off valve on the tank counterclockwise.
- Check for leaks using a non-corrosive leak detection fluid. Do **not** use a soap and water solution. Leak test pressures in excess of 13.9" W.C. (1/2 psi) of air pressure will invalidate the warranty.
- After confirming there are no leaks, turn OFF the gas supply by turning the gas shut-off valve on the tank clockwise.

4.4 Connecting the 12 V ignition



- Connect the positive and negative wires to the terminal block on the back of the Cooktop.



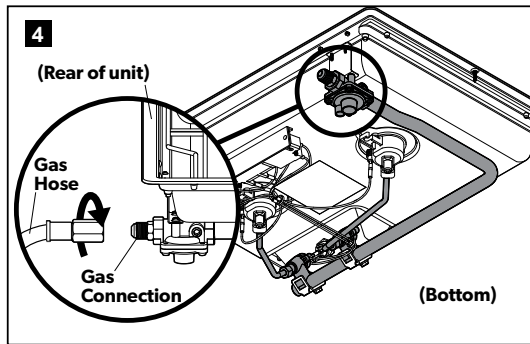
Connecting the wires to the wrong terminal will cause the igniter **not** to operate and can damage the ignition coil.



For 12 V circuits only. Connecting to a higher voltage circuit can cause ignition coil damage

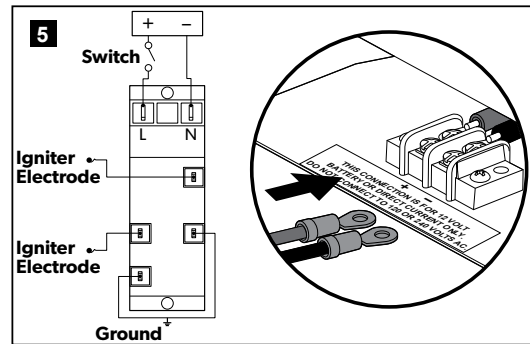


4.3 Connecting the propane gas



- Run a propane-certified hose from the propane supply tank to the gas connection on the Cooktop.
- Tighten according to appropriate RV and gas codes. Use two wrenches when tightening. Hold regulator in place while tightening hose.
- Turn ON the gas supply by turning the gas shut-off valve on the tank counterclockwise.
- Check for leaks using a non-corrosive leak detection fluid. Do **not** use a soap and water solution. Leak test pressures in excess of 13.9" W.C. (1/2 psi) of air pressure will invalidate the warranty.
- After confirming there are no leaks, turn OFF the gas supply by turning the gas shut-off valve on the tank clockwise.

4.4 Connecting the 12 V ignition



- Connect the positive and negative wires to the terminal block on the back of the Cooktop.

- i** Connecting the wires to the wrong terminal will cause the igniter **not** to operate and can damage the ignition coil.
- i** For 12 V circuits only. Connecting to a higher voltage circuit can cause ignition coil damage



5 OPERATION

5.1 Operating/safety guidelines

⚠ WARNING BURN HAZARD, FIRE, EXPLOSION, AND/OR CARBON MONOXIDE HAZARD Failure to obey the following warnings could result in damage, a burn hazard, possible explosion, carbon monoxide buildup, serious injury, or death:

- Avoid negative draft or positive draft situations or the operation of this Cooktop during excessively windy conditions. Negative draft caused by air moving across the Cooktop may blow out the burner flame or move the flame into the Cooktop, resulting in damage, a burn hazard, possible explosion, carbon monoxide buildup, injury, or death. Do not operate the Cooktop in excessively windy conditions as this may cause a negative or positive draft. Doing so may blow out the top burner flame during use, and can result in an explosion, fire hazard, injury, or death.
- The Cooktop must be completely separated and/or sealed from other air moving or air-consuming devices such as, but not limited to, furnaces, microwave ovens, clothes dryers, cooling fans, and doors or drawers in common cabinets. Failure to do so can affect the appliance(s) combustion air supply by creating either a negative or positive draft, which can result in serious injury or death.
- Do not use the Cooktop for space heating. Doing so may cause overheating of the Cooktop and/or could cause carbon monoxide poisoning, resulting in serious injury or death.
- While operating the Cooktop, frequently check the temperature of contents within cabinet areas above the Cooktop. Do not store flammable or combustible material in cabinets above, or above and adjacent to, the Cooktop. Failure to follow this instruction could result in a fire, serious injury, or death.
- Do **not** heat unopened containers. They could explode. The hot contents may cause burns and container particles may cause injury.
- Do **not** store flammable materials on, in, or near Cooktop. Any fumes can create an explosion and/or fire hazard.
- Do **not** operate Cooktop if it is damaged or not working properly.
- Verify sufficient gas supply before attempting to light any burner. Air in the gas supply line will significantly delay burner ignition, and a burner may light unexpectedly as the air in the line clears out and is replaced by LP gas; this unexpected ignition may burn you. Air may be introduced into the supply line when the vehicle gas bottle is replaced, during servicing of other gas appliances, etc.
- If any burner should extinguish (after initially lighting or due to accidental blowout), turn all burner knobs clockwise to OFF and WAIT 5 MINUTES before attempting to re-light the burner.
- Do **not** touch burners, burner grates, or areas near burners during and after use. Do **not** let clothing or other flammable materials contact burners or areas near burners until these areas have had sufficient time to cool.
- Use large enough pans to cover the burner area and contain the cooked food. This will reduce or eliminate heavy splattering or spills that can ignite and burn you.
- Be sure that glass cooking utensils are safe for use on the Cooktop. Only certain kinds of glass utensils are suitable for surface or burner use without breaking due to sudden changes in temperature.
- Never leave burners unattended when in use, as pan contents may boil over, resulting in smoke or a grease spill that may ignite.
- Turn pan handles inward, but **not** over other top burners. This reduces the chance of burns due to bumping a pan.
- Because grease is flammable, never allow grease to collect around top burners or on the Cooktop surface. Wipe up any grease spills immediately.
- Never use water on grease fires, and never pick up a flaming pan. Smother a flaming pan with a tight-fitting lid or cookie sheet. Flaming grease outside of the pan can be extinguished with baking soda or a multipurpose dry chemical or foam-type fire extinguisher.
- Use care when lighting a burner by hand. If the burner lights unexpectedly, or your hand is close to the burner, you may be burned.
- Burner flame should **not** extend beyond the edge of the cooking utensil. The flame could burn you and cause poor cooking results.
- Control knobs must be turned OFF when **not** cooking. Someone could be burned or a fire may start if a

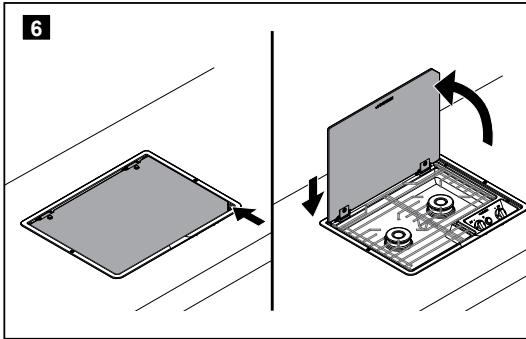


burner is accidentally left ON.

5.2 Operating your cover

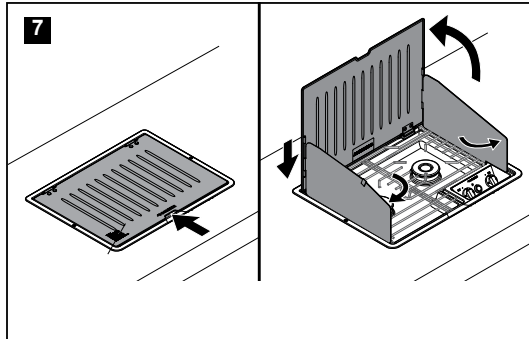
This section describes how to open and close the glass and metal covers on the Cooktop. The glass cover is preinstalled on the SECG model and the metal cover is preinstalled on the BPWM models. Covers are available as accessories for all other models.

Opening the glass cover



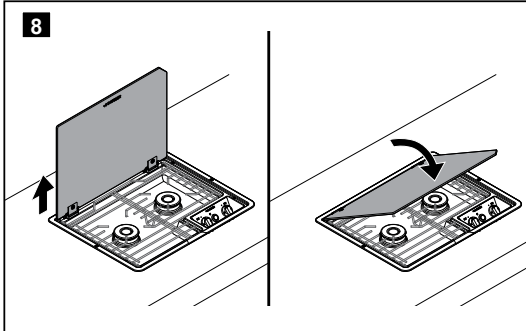
- Lift the Cover from the corner slot. Raise it completely, then gently lower the Cover down to rest on the back of the Cooktop.

Opening the metal cover



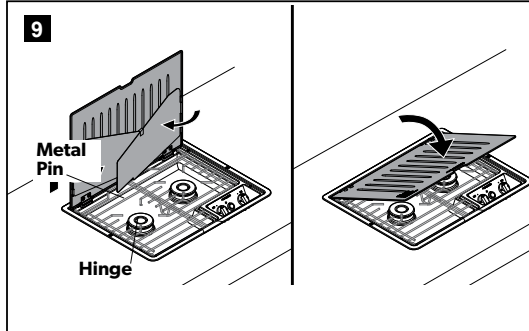
- Lift the Cover from the center slot. Raise it completely, then gently lower the Cover down to lock into the back of the Cooktop.
- Unclip the wind guards, open them, and lower them into position between the Cooktop and the grate.

Closing the glass cover



- Lift the Cover up, then gently lower it down onto the Cooktop.

Closing the metal cover



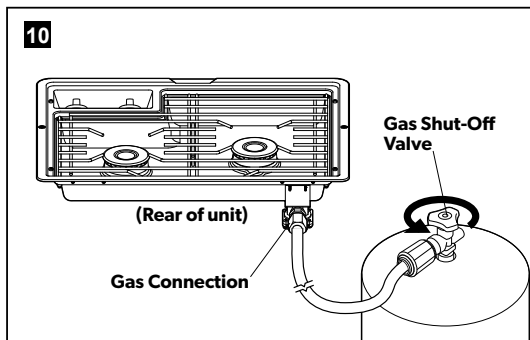
- Fold the wind guards, clip them together, and lift them up.
- Lift up the Cover, then gently lower it down onto the Cooktop.



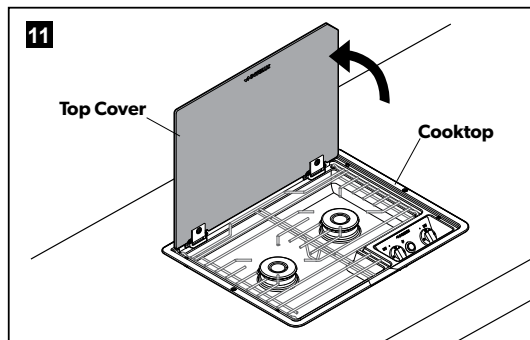
D21 Drop-in Cooktop

5.3 Preparing your cooktop for use

NOTICE Glass can be easily scratched. Use care when setting items on the top of the cover. Avoid sliding items across the cover. Do not drop objects onto the cover, as this may cause breakage.



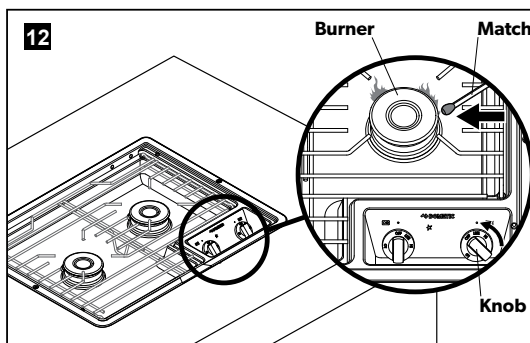
- Turn the gas ON at the gas shut-off valve (counterclockwise).



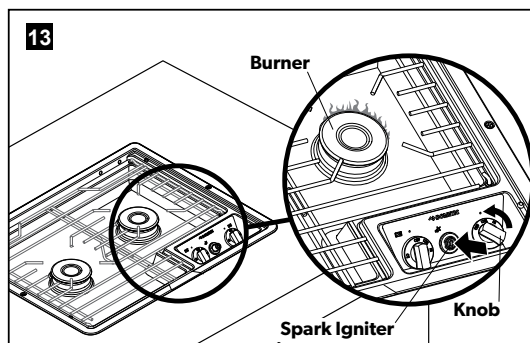
- i** If your Cooktop is equipped with a top cover, lift the top cover when operating the Cooktop. See "5.2 Operating your cover" on page 9.

5.4 Lighting the burner

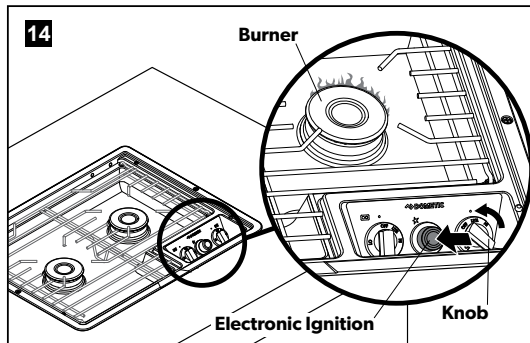
All burner controls operate counterclockwise and must be pressed inward when turning to light. Do **not** attempt to light more than one burner at a time.



- To light the Cooktop with a match, turn the knob counterclockwise and IMMEDIATELY hold a lit match near the burner.

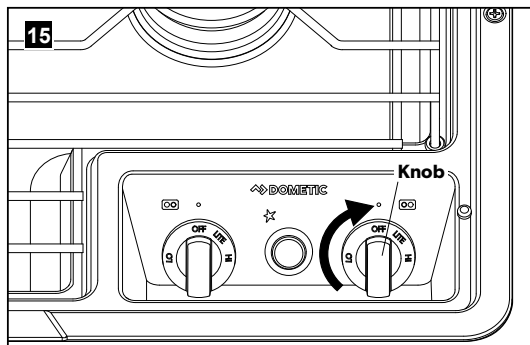


- To light the Cooktop using a spark igniter, turn the knob counterclockwise and press the spark igniter button until it clicks and the burner ignites.



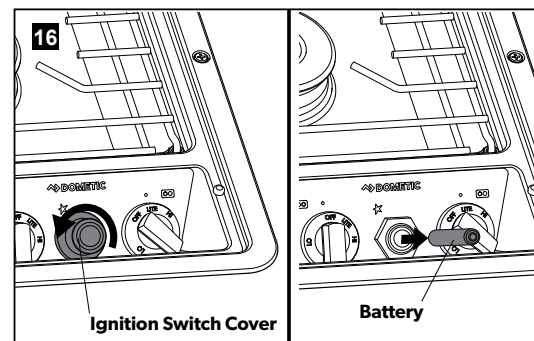
- To light the Cooktop using the electronic ignition, turn the knob counterclockwise, then press and hold the electronic ignition button until the burner lights.

5.5 Extinguishing the burner



- To extinguish the burner, turn the knob to the "OFF" position to stop the flow of gas to the burner.

5.6 Changing the battery (battery ignition)



- Unscrew the ignition switch cover.
- Remove and replace the AAA battery.



6 MAINTENANCE, CLEANING, AND STORAGE

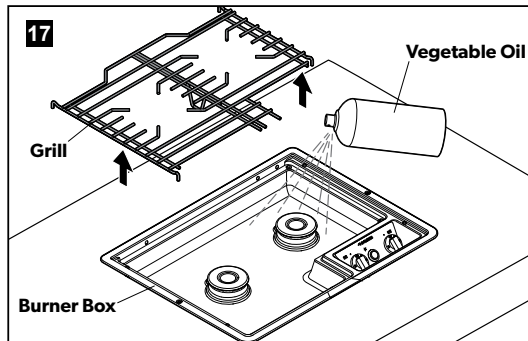
⚠ WARNING BURN HAZARD, FIRE, EXPLOSION, AND/OR CARBON MONOXIDE HAZARD. Keep Cooktop area clear of combustible cleaning materials, gasoline, and other flammable vapors and liquids. Failure to obey this warning could result in damage, a burn hazard, possible explosion, carbon monoxide buildup, serious injury, or death.

⚠ CAUTION Failure to obey the following cautions could result in damage or injury:

- All Cooktop surfaces, burner grates, and burners must be cool before cleaning or disassembling the Cooktop.
- Clean all surfaces quickly after spills.
- Use warm soapy water only to clean the burner grates, burner box, painted surfaces, porcelain surfaces, stainless steel surfaces, and plastic items on your Cooktop. Do **not** use gritty or acid-type cleaners. Do **not** use steel wool or abrasive cleaners, as they will damage your Cooktop. Use only non-abrasive plastic scrubbing pads.
- Do **not** allow foods containing acids (such as lemon juice, tomato juice, or vinegar) to remain on porcelain or painted surfaces. Acids may remove the glossy finish. Pitting and discoloration will result if spills are allowed to remain for any length of time on stainless steel. Do **not** allow spills to remain on burner caps. Caps could be permanently stained if spills are not cleaned up promptly.

i Proper installation and care will help keep your Cooktop looking and operating like new. Most cleaning can be performed using normal household items.

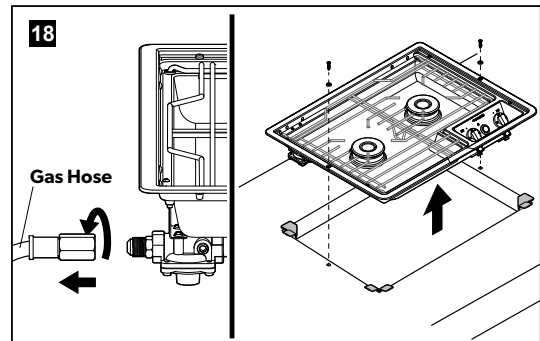
6.1 Cleaning your cooktop



- Remove the grill from the Cooktop.
- Dry all surfaces and the burner box then spray surfaces with vegetable oil or a similar product to help prevent the surface from rusting during storage.

i Clean oil off of the surface of the Cooktop before reinstalling and operating the Cooktop.

6.2 Storing your cooktop



i Refer to your installation manual for additional detail and safety messaging.

- Disconnect the gas hose from the Cooktop. Remove the screws securing the Cooktop and lift the Cooktop out of the cutout.
- Pack the Cooktop in its original packaging, or other suitable materials, to protect it from damage.

7 DISPOSAL

Place packaging material only in the appropriate recycling waste bins, whenever possible. Do **not** dispose of the range or slide-in without consulting a local recycling center or specialist dealer for details about how to dispose of the range or slide-in in accordance with the applicable national and local regulations.



8 REPLACEMENT PARTS

⚠ WARNING BURN HAZARD, FIRE, EXPLOSION, AND/OR CARBON MONOXIDE HAZARD. Use only Dometic replacement parts and components, which are specifically approved for use with the Drop-In Cooktop. Failure to obey this warning could result in damage, a burn hazard, possible explosion, carbon monoxide buildup, serious injury, or death.

For the most current parts information, visit www.eDometic.com.

LIMITED TWO-YEAR WARRANTY

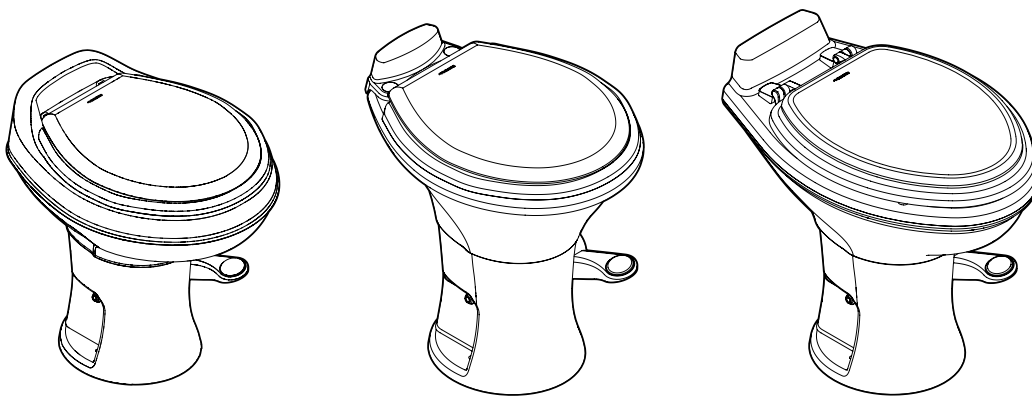
LIMITED TWO-YEAR WARRANTY AVAILABLE AT WWW.DOMETIC.COM/WARRANTY.

IF YOU HAVE QUESTIONS, OR TO OBTAIN A COPY OF THE LIMITED WARRANTY FREE OF CHARGE, CONTACT:

DOMETIC CORPORATION
CUSTOMER SUPPORT CENTER
1120 NORTH MAIN STREET
ELKHART, INDIANA, USA 46514
1-800-544-4881 OPT 1



↗ DOMETIC SANITATION TOILETS



300 Series (300, 301), 310 Series (310, 311), 320 Series (320, 321)

EN

Gravity-Flush Toilet

Installation and Operation Manual 2

FR

Toilette à chasse par gravité

Manuel d'installation et d'utilisation . . . 19

ES

Inodoro con descarga por gravedad

Manual de instalación y funcionamiento . . 37



WARNING

Cancer and Reproductive Harm
www.P65Warnings.ca.gov

Attention Consumers: This product is intended to replace an existing toilet in your RV. If you are creating a new installation or planning a more complicated project, please consult a qualified service professional.



Service Center & Dealer Locations

Visit: www.dometic.com

Read these instructions carefully.

These instructions **MUST** stay with this product.

Contents

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1 Explanation of Symbols and Safety Instructions

This manual has safety information and instructions to help you eliminate or reduce the risk of accidents and injuries.

1.1 Recognize Safety Information



This is the safety alert symbol. It is used to alert you to potential physical injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

1.2 Understand Signal Words

A signal word will identify safety messages and property damage messages, and also will indicate the degree or level of hazard seriousness.



DANGER!

Indicates a hazardous situation that, if **not** avoided, will result in death or serious injury.



WARNING

Indicates a hazardous situation that, if **not** avoided, could result in death or serious injury.



CAUTION

Indicates a hazardous situation that, if **not** avoided, could result in minor or moderate injury.

NOTICE: Used to address practices **not** related to physical injury.



Indicates additional information that is **not** related to physical injury.

1.3 Supplemental Directives

To reduce the risk of accidents and injuries, please observe the following directives before proceeding to install, operate, or service this appliance:

- Read and follow all safety information and instructions.
- Read and understand these instructions before installing, operating, or servicing this product.
- The installation must comply with all applicable local or national codes, including the latest edition of the following standards:

U.S.A.

- ANSI/NFPA70, National Electrical Code (NEC)
- ANSI/NFPA 1192, Recreational Vehicles Code
- ANSI Z21.57, Recreational Vehicles Code

Canada

- CSA C22.1, Parts I & II, Canadian Electrical Code
- CSA Z240 RV Series, Recreational Vehicles

1.4 Personal and Product Safety

NOTICE: Failure to adhere to the instructions in the following statements could result in personal, product, and/or property damage.

- Modifying this product may result in property damage.
- Always turn off the water supply before removing, installing, or repairing a plumbing fixture.



- Do **not** use chlorine or caustic chemicals, such as laundry bleach or drain-opening products, in the system. These products damage the seals in toilets and other plumbing valves.
- Do **not** flush foreign objects (paper towels, paper cups, diapers, sanitary napkins, etc.).
- Mechanical seal toilets are designed to only discharge directly into a holding tank. Avoid horizontal pipe runs (often found in conventional residential or commercial plumbing systems).
- The toilet bowl **must** be regularly cleaned and the system winterized according to the procedures in this manual, or your warranty coverage may be voided. Refer to "Performing Routine Toilet Cleaning" on page 11 and "Winterizing and Storing the Toilet" on page 12.

2 Pre-Installation

This section provides product information, including specifications, and helps you prepare to install your new toilet.

2.1 Intended Use

The Dometic 300, 310, and 320 Series Gravity-Flush Toilets are designed for use in recreational vehicles (RVs). These products are lightweight, residential-size toilets for installation directly above a holding tank.

The manufacturer accepts no liability for damage in the following cases:

- Faulty assembly or connection
- Damage to the product resulting from mechanical influences and excess voltage
- Alterations to the product without express permission from the manufacturer
- Use for purposes other than those described in the operating manual

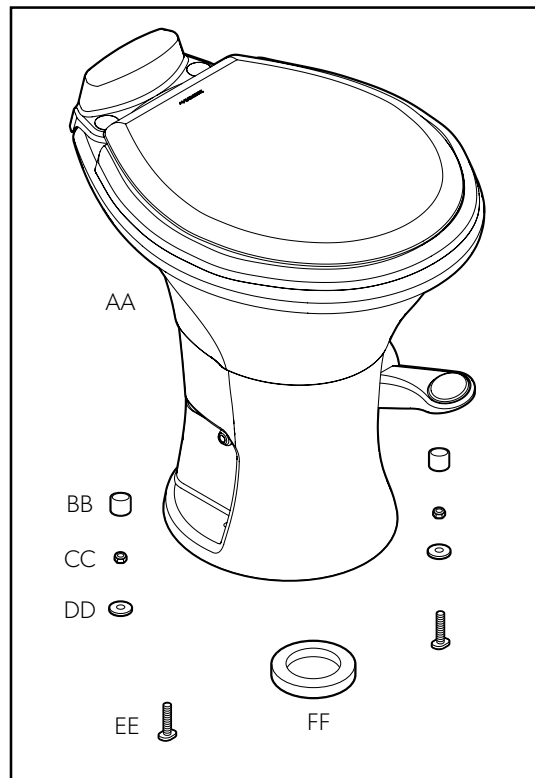
Dometic Corporation reserves the right to modify appearances and specifications without notice.



The images are for reference purposes only. Parts and part locations may vary according to specific product models. Measurements may vary ± 0.38 in. (10 mm).

2.2 Package Contents

This section shows the package contents provided with the toilet models. Actual package contents may vary. Refer to the complete parts list (available online at www.dometic.com) for additional information.

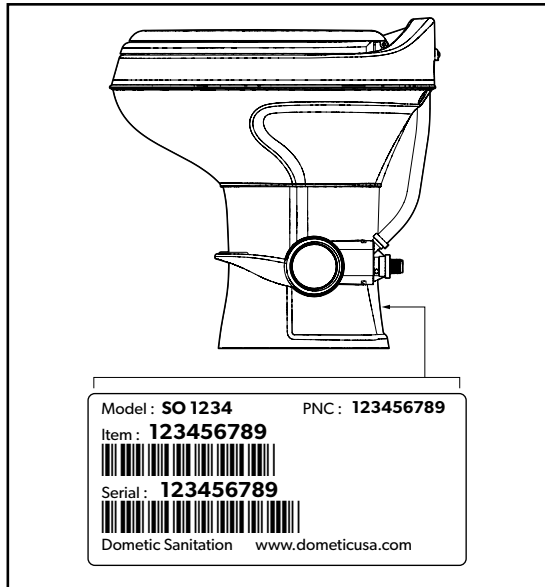


1 Contents

- | | |
|------------------------------|---------------------------------|
| (AA) Assembled Toilet | (DD) Floor Mounting Washer (x2) |
| (BB) Floor Mounting Cap (x2) | (EE) Floor Mounting T-bolt (x2) |
| (CC) Floor Mounting Nut (x2) | (FF) Floor Flange Seal |

2.3 Model Identification

The toilet model identification label is located on the toilet base under the water valve. Have the information from this label ready, if contacting Dometic for service.



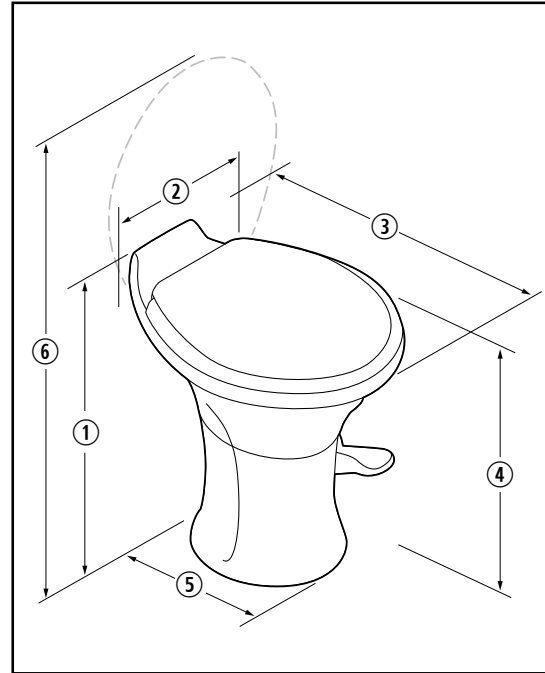
2 Model ID Label Location

2.4 Product Composition

Toilet Bowl	Vitreous ceramic (310, 311, 320, 321 models) Polypropylene (300, 301 models)
Toilet Seat	Polypropylene (300, 301, 310, 311 models) Enameled wood (320, 321 models)
Flush Ball Seal	Nitrile butyl rubber
Toilet Base	Polypropylene
Foot Pedal	Polypropylene
Water Valve	Polypropylene
Vacuum Breaker	ABS/polypropylene
Floor Seal	Nitrile rubber, foam

2.5 Toilet Dimensions

This section provides the product dimensions for both the standard-height and low-profile toilet models.



3 Product Dimensions: Both Heights

2.5.1 Standard-Height Toilet Dimensions

Ref	300 Model in. (mm)	310 Model in. (mm)	320 Model in. (mm)
①	19.75 (502)	20 (508)	19.75 (502)
②	16 (406)	15 (381)	14.75 (375)
③	19.75 (502)	19 (483)	22 (559)
④	Seat Height: 18.25 (464)	Seat Height: 18 (457)	Seat Height: 18.25 (467)
⑤	13.25 (337)	14.75 (375)	16 (406)
⑥	Seat Lid Up: 33.5 (851)	Seat Lid Up: 33 (838)	Seat Lid Up: 35 (889)



2.5.2 Low-Profile Toilet Dimensions

Ref	301 Model in. (mm)	311 Model in. (mm)	321 Model in. (mm)
①	15.5 (394)	15.25 (387)	15 (381)
②	16 (406)	15 (381)	14.75 (375)
③	19.75 (502)	19 (483)	22 (559)
④	Seat Height: 14 (356)	Seat Height: 13.75 (349)	Seat Height: 13.5 (343)
⑤	13 (330)	14.75 (375)	15.75 (400)
⑥	Seat Lid Up: 30 (762)	Seat Lid Up: 29.5 (749)	Seat Lid Up: 31 (787)

2.6 Installation Requirements

This manual will help you replace an existing toilet. To create a new location for your new toilet, contact a qualified service professional.

Verify that your existing toilet:

- Has a flexible water supply line coming through the floor or wall. If the line comes out of the floor, you will need an elbow adapter kit.
- Is attached to the floor with two bolts that are perpendicular to the back wall.
 - If there are four bolts, you will need a Universal Mounting Kit, in the appropriate color.
 - If you are changing the toilet orientation (the angle of the toilet to the room), you can use a Universal Mounting Kit, or remove the floor flange and install a new one in your preferred orientation.
- Is level with the floor. If the flange is installed in the sub-floor, you may need a taller seal than the one provided.

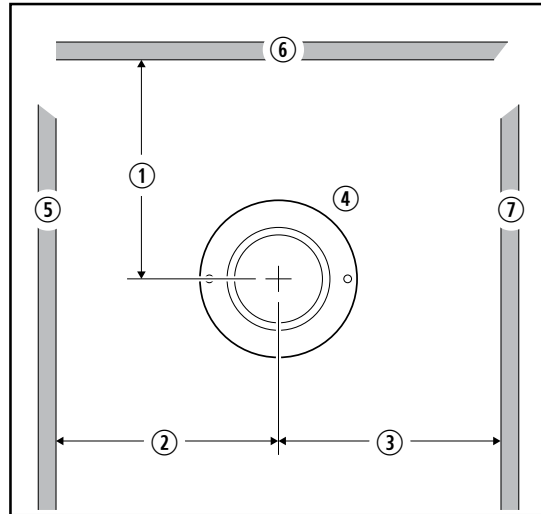
Make sure there is enough space for your new toilet. Compare the dimensions for your model listed in "Toilet Dimensions" on page 4 to the measurements listed in "Minimum Space Requirements" on page 5. Verify:

- The rough-in size (from the centerline of the flange to the back wall)
- The door swing clearance

- That the foot pedal, when depressed, will touch the same flat surface on which the toilet is installed.

i For a more pleasant installation day, empty the holding tank before you begin.

2.6.1 Minimum Space Requirements



4 Required Clearances, Including Rough-In

①	300 Model: 8.5 (216)	10 (254)	11 (279)
	301 Model: 8.75 (222)		
②	11 (279)		
③	11 (279)		
④	Floor Flange		
⑤	Left Wall		
⑥	Back Wall		
⑦	Right Wall		



2.6.2 Required Specifications

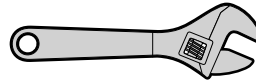
Water Supply Fitting	0.5 in. NPT
Static Water Pressure	30–100 PSI (206.8–689.5 kPa)
Recommended Flow Rate¹	3–5 gpm (11.4–18.9 lpm)
Minimum Flow Rate	2 gpm (9.5 lpm)
Discharge Floor Flange ID	3 in. (76 mm)
Discharge Floor Flange Thickness	0.25–0.44 in. (7–11 mm)

¹ Water supply that exceeds 5.0 gpm (18.9 lpm) may require a flow restrictor at the toilet inlet.

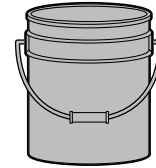
2.7 Tools and Materials

Dometic recommends the following tools and materials to install the product:

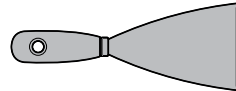
Required Tools and Materials (Not Included)



Pliers,
Adjustable Wrench,
or Torque Wrench

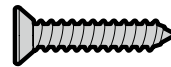


Small Bucket

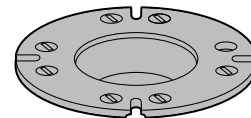


Putty Knife (to remove
flange seal)

Optional Materials (Not Included)



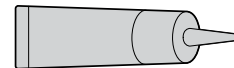
4 - Floor Flange
Screws (8 preferred)



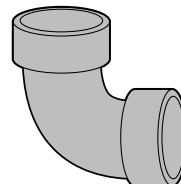
Floor Flange
(must match the one
you are replacing)



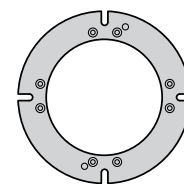
Screwdriver



Caulk (if installed in a
wet area)



Elbow Adapter
(depends on water
supply line)



Universal
Mounting Kit



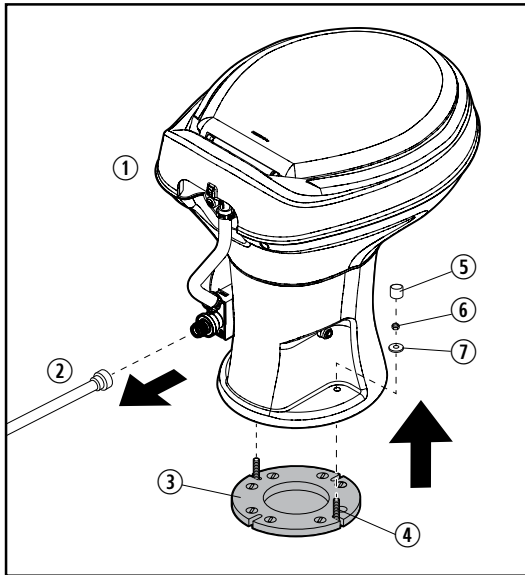
3 Installation

i Make sure to follow the recommended installation requirements in this manual.

This section provides instructions for removing an existing toilet, replacing the floor flange (if necessary), and installing your new toilet.

3.1 Removing an Existing Toilet

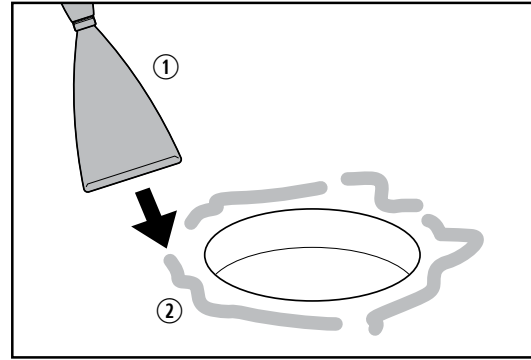
Follow these steps when replacing an older toilet, to prepare for the new installation:



5 Removing an Old Toilet

- ① Old Toilet
- ② Water Supply Line
- ③ Existing Floor Flange
- ④ Existing T-bolts
- ⑤ Existing Mounting Cap
- ⑥ Existing Mounting Nut
- ⑦ Existing Mounting Washer

1. Turn off the water supply.
2. Disconnect and drain the water supply line.
3. Remove the existing floor mounting caps, floor mounting nuts, and floor mounting washers.
4. Lift the existing toilet off the bolts.
5. Remove and discard the existing floor mounting T-bolts.



6 Removing the Existing Seal Material

- ① Putty Knife
- ② Old Seal Material

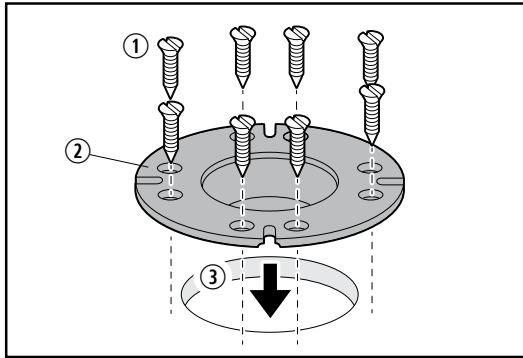
6. Use a putty knife to remove and discard any existing seal material from the floor and the floor flange.
7. Evaluate the floor flange. If it is damaged, remove it and install a new one, following the steps in "Installing a New Floor Flange" on page 7.
8. If you are installing a Universal Mounting Kit, follow the instructions that came with the kit.
9. Make sure the top surface of the floor is clean and free of any debris or sealant.

3.2 Installing a New Floor Flange

i If you will use the existing floor flange, skip to "Installing the New Toilet" on page 8.

i Consider engaging a qualified service professional if you must install a new floor flange.

1. Remove the existing floor flange by unfastening and discarding the existing screws. If the floor flange is glued down, you may need additional tools to remove it.
2. Before fastening the new floor flange, refer to "Installation Requirements" on page 5 to verify:
 - The toilet mounting holes are located at your preferred orientation.
 - The center of the floor flange is at least the recommended distance from the back wall for your toilet model.

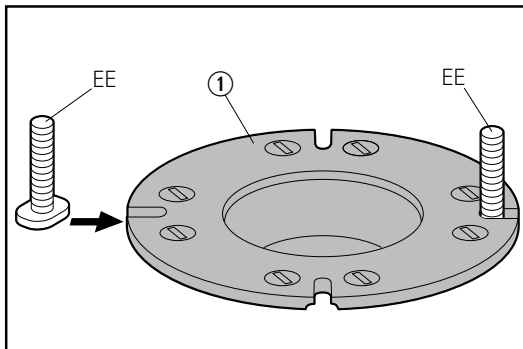


7 Installing the New Floor Flange

- ① Screws ③ Outlet hole
 - ② New floor flange
3. Place the new floor flange into the outlet hole and secure it to the floor with a minimum of four screws (eight are preferred).

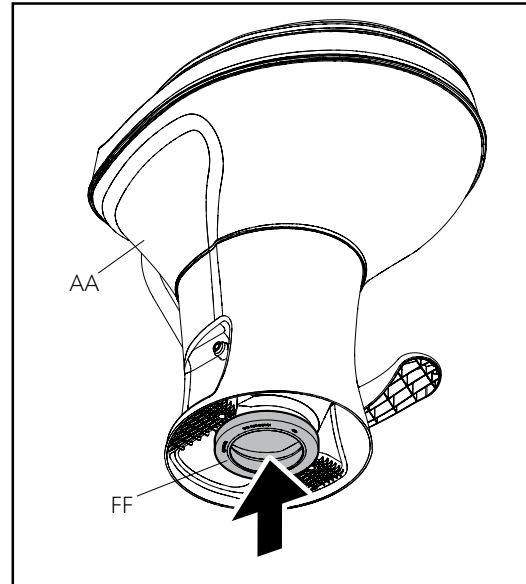
3.3 Installing the New Toilet

Follow these steps to install your new toilet:



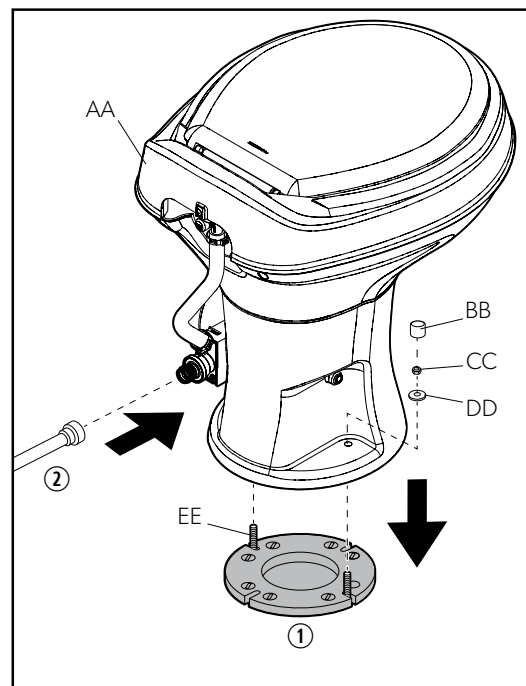
8 Inserting the T-bolts

- ① Floor flange
1. Insert the new floor mounting T-bolts (EE) into the slots in the floor flange.



9 Installing the Floor Flange Seal (FF)

2. Install the new floor flange seal (FF) to the base of the toilet (AA). On some models, it is already installed.
3. Carefully position the toilet (AA) over the floor flange.



10 Securing the New Toilet

- ① Floor Flange ② Water Supply Line
4. Align the holes in the toilet base with the floor mounting T-bolts (EE) as you lower the toilet (AA) onto the floor flange.



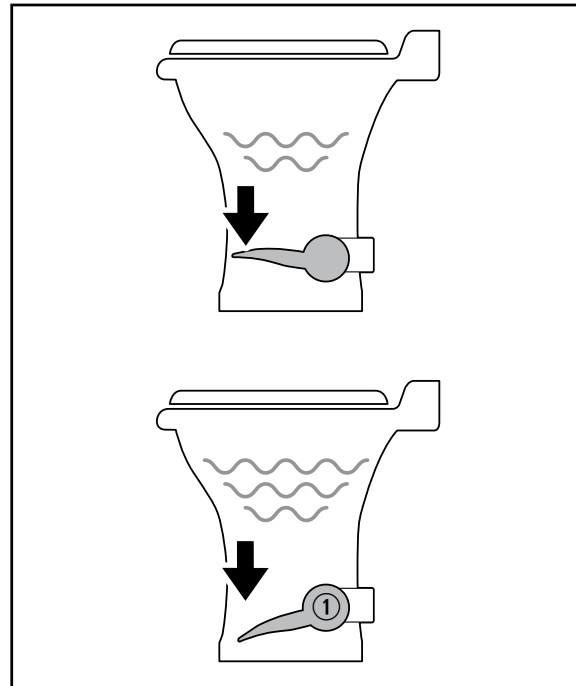
- i** Be sure the entire outlet drain of the toilet base fits inside the floor flange outlet hole to avoid leaks.
 - i** The toilet base might not rest evenly against the floor yet. The floor flange seal (FF) will compress as you complete the following steps.
5. Place the new floor mounting washers (DD) and then the new floor mounting nuts (CC) onto the floor mounting T-bolts (EE).
 6. Tighten the floor mounting nuts (CC). If a torque wrench is available, tighten them to 30–40 in. lb (3.4–4.5 N·m). Do not overtighten. Alternate between sides when tightening to prevent distortion. When the floor-mounting nuts (CC) are tight, the base of the toilet (AA) should be securely attached and flat against the floor.
 7. Attach the floor mounting caps (BB) onto the floor mounting nuts (CC).
- i** If the toilet (AA) is being installed in a shower stall (or other wet area), apply a bead of caulk around the base of the toilet to prevent water seepage under the base.
8. Connect the water supply line and torque the connection to 30–40 in. lb (3.4–4.5 N·m). Do not overtighten.
- i** If the water supply line comes out of the floor, install a 1/2 in. (13 mm) elbow fitting or adapter.
9. Turn on the water supply.
 10. Flush the toilet several times and check for leaks. Refer to “Flushing the Toilet” on page 9.
 11. Test for leaks by filling the bowl with water and letting it sit for an hour.

4 Operation

This section provides instructions on the proper use of these gravity-flush toilets.

4.1 Adding Water to the Bowl

Adding water to an empty bowl helps prevent holding tank odors from entering the living space. Adding water is recommended prior to flushing solids and toilet paper.



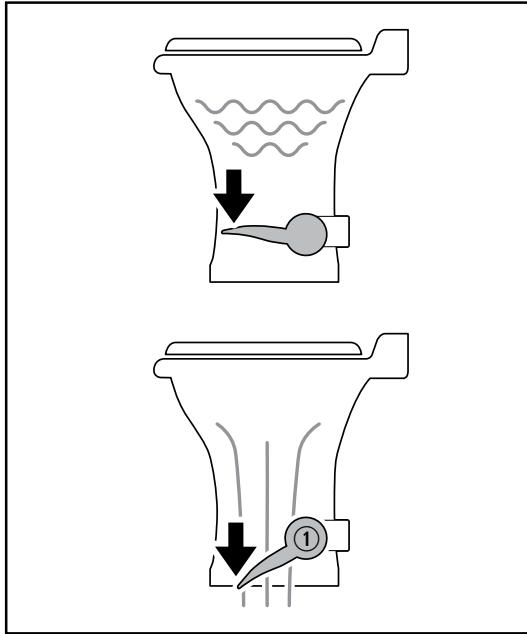
11 Partially Depressing the Flush Pedal

① Flush Pedal

1. To add water to the toilet, depress the flush pedal part way. Water flows into the bowl while the flush ball remains closed.
2. If the flush ball moves, let up on the pedal slightly.

4.2 Flushing the Toilet

NOTICE: Flush only water, bodily wastes, and rapid-dissolving toilet tissue. Do not flush foreign objects. Do not flush wet wipes, sanitary napkins, diapers, paper cups, cotton swabs, food, hair, or liquids such as oils or solvents. Failure to follow these instructions could cause clogging or damage to the toilet or the toilet system.



12 Fully Depressing the Flush Pedal

① Flush Pedal

1. To flush, depress the pedal until it contacts the floor.
2. Release the pedal after a complete flush.
 - When flushing liquids, depress the pedal for approximately 1–2 seconds.
 - When flushing solids, depress the pedal until the contents of the bowl rinses from the bowl. Flushing longer than necessary will cause the holding tank to fill too quickly.

A small amount of water will collect in the bowl after a flush to create an airtight seal.

i Residual water trickle in the ceramic bowls: Due to the integrated rim of the models 310, 311, 320, and 321 toilets, water may continue to trickle into the toilet bowl for up to 20 minutes after flushing. If the water trickle continues after 30 minutes, replace the water valve. Refer to “Replacing the Water Valve” on page 14.

So that holding tank odors do not enter the living space, make sure 1 in. (24 mm) of water remains in the toilet bowl. Depending on the plumbing system and user operation, adding water may be required to achieve this water depth. Refer to “Adding Water to the Bowl” on page 9.

5 Maintenance

Properly cleaning, winterizing, and maintaining your toilet will increase its lifespan.

NOTICE: If this toilet ever requires service, read the following statements before servicing the product. Failure to follow these guidelines can cause product damage and **can void your warranty coverage:**

- Do **not** separate the ceramic bowl from the plastic base. Unlike other Dometic foot-pedal toilets, the bowl and base of the 300, 310, and 320 series toilets should **not** be separated for any reason.
- Do **not** remove the foot pedal from the base. This toilet has a factory-sealed bowl-to-base assembly.
- Do **not** disassemble the components.
- Refer to this manual and replacement kit instructions for maintenance and service information.

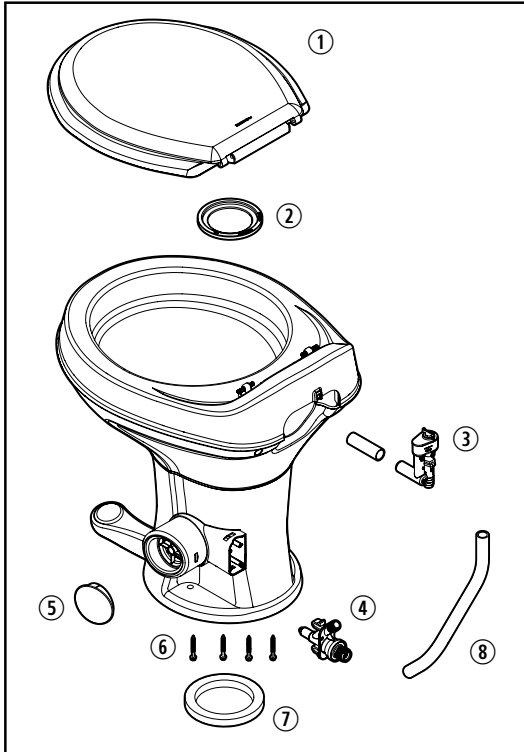
The toilet does **not** need to be removed from the vehicle (or unfastened from the floor) for basic repairs, like the flush ball seal replacement and water valve replacement.

If you need to call Dometic for assistance, have the exact model number available. Refer to “Model Identification” on page 4.



5.1 Serviceable Parts

This section shows the replacement parts for the toilet models. Actual available parts may vary. Refer to the complete parts list (available online at www.dometic.com) for additional information. To order parts, contact your local Dometic service partner or dealer.



13 300 Series Serviceable Parts

- | | |
|-------------------|---------------------|
| ① Toilet Seat | ⑤ Pedal Cover |
| ② Flush Ball Seal | ⑥ T-Bolts |
| ③ Vacuum Breaker | ⑦ Floor Flange Seal |
| ④ Water Valve | ⑧ Supply Hose |

5.2 Maintenance Kits and Materials

These kits are available for purchase:

- 300/310/320 Series Toilet Water Valve Replacement Kit
- Flush Ball Seal Replacement Kit
- Vacuum Breaker Kit

Recommended for cleaning:

- SeaLand® Toilet Bowl Cleaner
- Soft bristle brush
- Rubbing alcohol (300/301 only)

Recommended for winterization/storage:

- Nontoxic antifreeze (propylene glycol)

Optional for troubleshooting:

- Sealand Holding Tank Deodorant
- Silicone spray

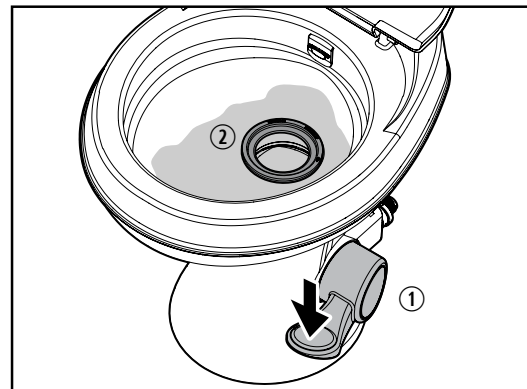
5.3 Performing Routine Toilet Cleaning

For routine cleaning, use SeaLand toilet bowl cleaner. If this cleaner cannot be found in your area, contact Dometic for your nearest dealer. If the cleaner is not available, use a non-abrasive bathroom and toilet bowl cleaner. Follow label instructions.

For stubborn stains on model 300 and 301 toilet bowls, carefully use rubbing alcohol to wipe and remove the stain.

5.4 Cleaning the Flush Ball and Seal

After a period of time, mineral deposits from hard water may build up on the flush ball or seal, resulting in a slow water leak. To prevent this, periodically clean the flush ball and seal.



14 Cleaning Debris from the Flush Ball Seal

- ① Flush Ball Seal ② Flush Pedal

1. Remove minor debris from the flush ball and seal by slowly depressing and releasing the flush pedal several times. This will loosen and rinse debris from the surfaces. Repeat several times for stubborn buildup.
2. If step 1 does not fully clean the ball and seal, clean with a soft bristle brush and SeaLand toilet bowl cleaner.
 - Fully clean the top of the flush ball and under the seal where it contacts the flush ball.



- After cleaning the underside of the seal, apply light, downward pressure to the top of the seal while brushing around the full perimeter of the seal.

i If the ball pivot arm becomes dislodged while cleaning inside the base beneath the flush ball and seal, re-engage it into the pivot point. Refer to Figure 16 for the location of the pivot point.

i If this procedure does not correct a leaking seal, it may require replacement. Detailed replacement instructions are included with the replacement flush ball seal kits.

5.5 Winterizing and Storing the Toilet



WARNING: POISON HAZARD.

Do **not** use automotive-type antifreeze (ethylene glycol) in freshwater systems. Failure to obey this warning could result in death or serious injury:

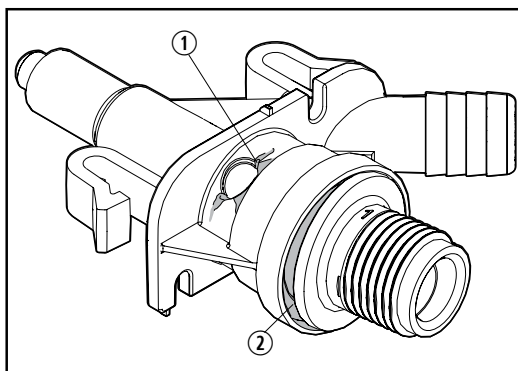


CAUTION: BODILY HARM HAZARD.

This toilet is **not** intended for use when exposed to temperatures below freezing. Failure to obey this caution could result in minor or moderate injury.

NOTICE: The toilet warranty expressly excludes coverage for any damages to the toilet or the vehicle that may occur due to improper winterization of the toilet. Freeze damage that results in leaks to the water valve is an indicator of improper winterization.

5.5.1 Preventing a Frozen Water Valve



15 Identifying a Damaged Water Valve

① Freeze Damage

② Water Valve Damage

These toilet water valves exceed the applicable standards for maximum water pressure as defined by the North American plumbing code agencies. However, if trapped water freezes in the piping that supplies water to the toilet, it expands and creates extremely high pressure that can damage the valve.

If the freeze damage indicator window (1) has white stress marks, it indicates freeze-damage. Water valve damage is due to severe exposure to below-freezing temperatures.

To avoid damage, winterize the toilet as described in this manual. If freeze damage occurs as a result of improper winterization, replace the water valve with a 300/310/320 series toilet water valve kit.

If the water valve is returned for a warranty claim, Dometic reserves the right to deny the claim if the problem is caused by freeze damage.



Use nontoxic antifreeze (propylene glycol) designated for potable water systems (See the vehicle owner's manual).

When a toilet may be exposed to temperatures below freezing, the toilet must be winterized using the "Non-toxic Antifreeze Winterization Method" on page 12 or the "Drain Water from the Toilet Method" on page 13. When a toilet is stored for long periods of time, or the water becomes stagnant, flush the system using the "Drain Water from the Toilet Method" on page 13.

5.5.2 Non-toxic Antifreeze Winterization Method



This is the recommended method.

1. Pour non-toxic antifreeze into the potable water tank according to the instructions from the antifreeze manufacturer.
2. Flush the toilet (several times) until the antifreeze has flowed completely through the toilet.

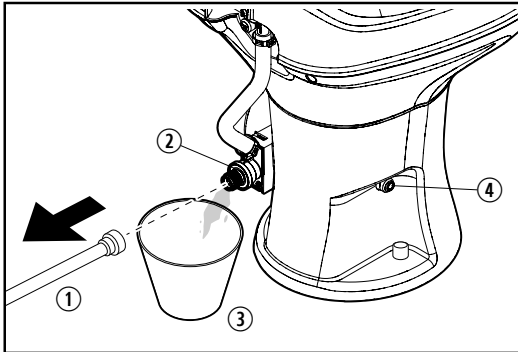


For toilets with a hand sprayer, the hand sprayer must be turned on for antifreeze to cycle through the sprayer.



5.5.3 Drain Water from the Toilet Method

1. Turn off the water supply to the toilet.



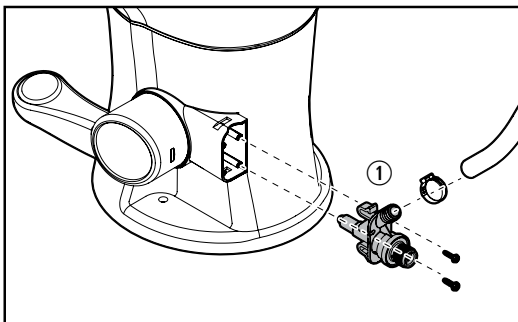
16 Removing the Water Supply

- ① Water Supply Line
 - ② Water Inlet Valve
 - ③ Small Bucket
 - ④ Pivot Point for the Ball Pivot Arm
2. Remove the water supply line from the water valve.
 3. Place a small bucket under the water valve inlet to catch draining water.
 4. Depress the flush pedal and allow water to completely drain from the water valve and vacuum breaker.
 5. Leave the water line disconnected until the threat of freezing temperatures is past.

NOTICE: Do **not** leave the RV unoccupied for extended periods of time with a municipal water supply connected, or with the onboard water pump turned on, when there is a possibility of freezing temperatures.

5.6 Replacing the Water Valve

Refer to the detailed replacement instructions in the water valve replacement kit before removing or installing a water valve assembly.



17 Removing the Water Valve Assembly

- ① Water Inlet Valve Assembly

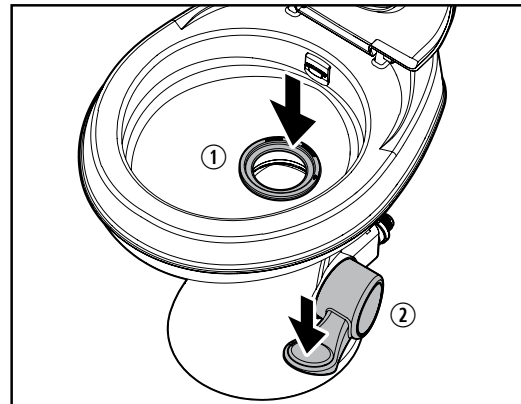


In cold climates, be sure to follow the winterizing procedure in this manual to help avoid water valve failure.

5.7 Reconditioning the Flush Ball Seal

Each toilet is factory-tested to assure a watertight seal in the toilet bowl. This quality-assurance testing process requires a device to hold the flush ball open, which may temporarily distort the flush ball seal from its original shape. As a result, it may cause the flush ball seal to leak water into the holding tank during normal use.

If you discover a water leak into the holding tank, recondition the flush ball seal into its original shape.



18 Reconditioning the Flush Ball Seal

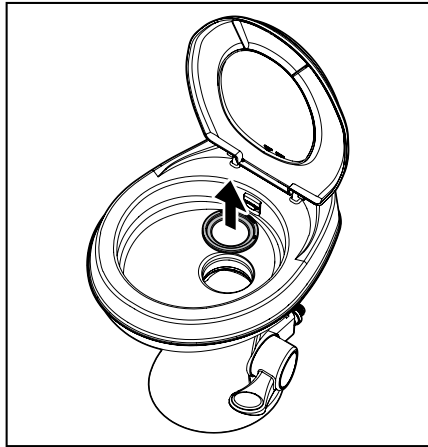
- ① Flush Ball Seal
 - ② Flush Pedal
1. Depress the pedal to hold the flush ball open, then lightly press down around the edge of the seal with a finger to conform the seal to the flush ball.
 2. Release the pedal.
 3. Keeping the flush ball closed, pour 1 qt (0.9 L) of hot tap water into the toilet bowl.
 4. Let the water cool completely.

If the toilet does not hold water in the bowl, refer to "Troubleshooting" on page 15 before you replace the flush ball seal.



5.8 Replacing the Flush Ball Seal

Refer to the detailed replacement instructions in the flush ball seal replacement kit before removing or installing the seal.



19 Removing the Flush Ball Seal

6 Troubleshooting

Problem	Possible Cause	Suggested Remedy
Water will not stay in the bowl.	The flush ball seal is not properly positioned.	Refer to "Reconditioning the Flush Ball Seal" on page 13.
	The flush ball seal's shape is temporarily distorted.	Refer to "Reconditioning the Flush Ball Seal" on page 13.
	The flush ball or flush ball seal is dirty.	Clean and seal the flush ball. Refer to "Cleaning the Flush Ball and Seal" on page 11.
	The flush ball seal is worn or defective.	Replace the flush ball seal. To replace the flush ball seal, refer to the detailed instructions included with the flush ball seal replacement kit.
Water flow into the toilet will not stop.	The water valve is worn or defective.	Replace the water valve. Refer to "Replacing the Water Valve" on page 13.
Water does not enter the toilet bowl properly.	There is an insufficient water flow rate at the toilet inlet.	Make sure the flow rate at the toilet inlet is 3–5 gpm (11.4–18.9 lpm), which is the recommended rate.
	The screen at the water valve inlet is clogged.	Clean the screen, on the inlet side, using a cotton swab or an old toothbrush. Do not disassemble the valve.
	The water valve is worn or damaged.	Replace the water valve. Refer to "Replacing the Water Valve" on page 13.
	There are plugged rim wash holes or a plugged rim jet (300 series only) in the toilet.	Clean the rim wash holes or rim jet.
Odor emits from the toilet when the flush ball is open.	The holding tank vent is plugged.	Clear obstructions from the vent. Refer to the tank owner's manual.
	The odor is from the holding tank contents.	Add deodorant to the holding tank.



Problem	Possible Cause	Suggested Remedy
Odor emits from the toilet when the flush ball is closed.	There is no water in the bowl.	Add water to the bowl. Refer to "Adding Water to the Bowl" on page 9.
	The flush ball seal is damaged.	Replace the flush ball seal. To replace the flush ball seal, refer to the detailed instructions included with the flush ball seal replacement kit.
	The floor flange seal is damaged.	Replace the floor flange seal. Refer to "Removing an Existing Toilet" on page 7 and "Installing the New Toilet" on page 8, using the existing toilet and a new seal throughout the procedures.
The flush ball will not close completely.	There is too much friction between the flush ball and the seal.	Clean and lubricate the flush ball and flush ball seal with silicone spray or furniture polish.
The flush ball will not operate properly.	The ball pivot arm may have become dislodged when cleaning beneath the flush ball and seal.	Re-engage the ball pivot arm back into the pivot point. Refer to Figure 16 for the location of the pivot point.
The hand sprayer leaks.	The hand sprayer is defective.	Replace the hand sprayer. Refer to the hand sprayer owner's manual.
Water is leaking from the water valve.	The water line connection is loose or not seated properly.	Make sure that the threads are not cross-threaded and tighten the connection.
	The water valve is damaged or defective.	Replace the water valve. Refer to "Replacing the Water Valve" on page 13.
Water is leaking from the toilet base.	The toilet is not secured to the floor.	Tighten the toilet mounting bolts. Follow the steps in "Installing the New Toilet" on page 8.
	The floor flange seal is worn or defective.	Replace the floor flange seal. Refer to "Removing an Existing Toilet" on page 7 and "Installing the New Toilet" on page 8, using the existing toilet and a new seal throughout the procedures.



Problem	Possible Cause	Suggested Remedy
Water is leaking from the rear of the toilet.	There is a loose vacuum breaker.	Make sure the vacuum breaker stem is pushed fully into the sealing grommet in the back of the bowl (310 and 320 series), or securely connected to the rim jet (300 series).
	The vacuum breaker is damaged or defective.	Replace the vacuum breaker. Follow the instructions provided with the new vacuum breaker.
	The supply hose is damaged or defective.	Tighten the supply hose clamps. Replace the supply hose.
	The toilet bowl is cracked or defective.	Replace the toilet.

7 Disposal



Place the packaging material in the appropriate recycling waste bins, whenever possible. Consult a local recycling center or specialist dealer for details about how to dispose of the product in accordance with all applicable national and local regulations.

8.2 All Other Regions

The statutory warranty period applies. If the product is defective, please contact the manufacturer's branch in your region (see the back of the instruction manual for the websites) or your retailer.

For repair and guarantee processing, please include the following documents when you send in the device:

- A copy of the receipt with purchasing date
- A reason for the claim or description of the fault

8 Warranty Information

Refer to the sections below for information about warranty and warranty support in the US, Canada, and all other regions.

8.1 United States and Canada

LIMITED WARRANTY AVAILABLE AT WWW.DOMETIC.COM/WARRANTY.

IF YOU HAVE QUESTIONS, OR TO OBTAIN A COPY OF THE LIMITED WARRANTY FREE OF CHARGE, CONTACT:

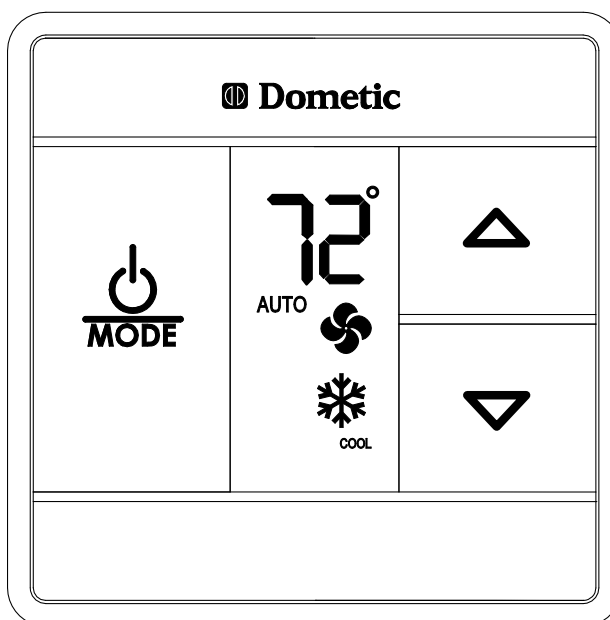
DOMETIC CORPORATION
CUSTOMER SUPPORT CENTER
5155 VERDANT DRIVE
ELKHART, INDIANA 46516
1-800-544-4881 OPT 1



OPERATING INSTRUCTIONS

CAPACITIVE TOUCH THERMOSTAT

MODEL
3316410.XXX {
COOL/FURNACE
COOL/FURNACE/HEAT STRIP
COOL/FURNACE/HEAT PUMP



Read these instructions carefully. These instructions MUST stay with this product.

REVISION A

Form No. 3316464.000 12/15
(French 3316465.000_A)
©2015 Dometic Corporation
LaGrange, IN 46761

USA

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Elkhart, IN 46516

CANADA

Dometic Corporation
46 Zatonski, Unit 3
Brantford, ON N3T 5L8
CANADA

Service Center & Dealer Locations

Please Visit:
www.eDometic.com



INTRODUCTION

This Capacitive Touch thermostat (hereinafter referred to as “CT thermostat” or “product”) is designed and intended for use in a Recreational Vehicle (hereinafter referred to as RV). Use these instructions to ensure correct installation, function, and operation of product.

Dometic Corporation reserves the right to modify appearances and specifications without notice.

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DOCUMENT SYMBOLS



Indicates additional information that is **NOT** related to physical injury.



Indicates step-by-step instructions.



FAMILIARIZATION

To familiarize yourself with the operation of your new CT thermostat, review the following diagrams and accompanying text explaining functional characteristics of this system.

A. Features

- Capacitive Touch Interface
- Blue LED Backlight
- Liquid Crystal Display (LCD)
- Auto Fan
- Indoor Temperature Display
- Air conditioner can provide additional indoor air circulation during furnace operation.

B. System Initialization

A system initialization will need to be performed by installer after system installation.

1. Make sure CT thermostat is Off. See “D. Quick Reference” on page (3).
2. Press the **▲** button, and simultaneously press and hold the **⏻ / Mode** button for three seconds. LCD will show “- -”.
This completes system initialization.
Furnace On / Off temperature differential should be set at this time. See “C. “Furnace” - Furnace Mode” on page (7) for more information.

C. Factory Preset Settings

The CT thermostat is pre-programmed. Review settings below and adjust for personal comfort level.

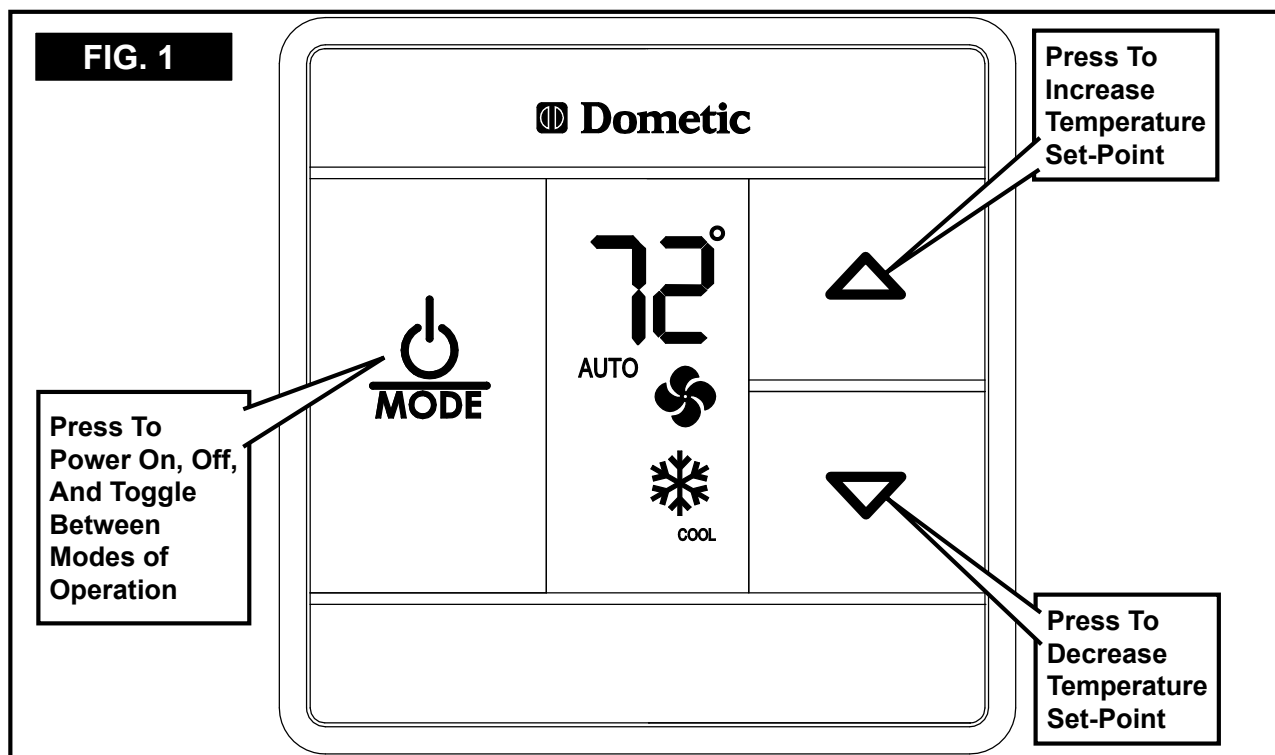
Factory Preset Settings	
Heating	68°F / 20°C
Cooling	72°F / 22°C
Fan Speed	Auto
Mode	Off
Furnace Differential	2°F

D. Quick Reference

See (FIG. 1) for control button quick reference.



FAMILIARIZATION



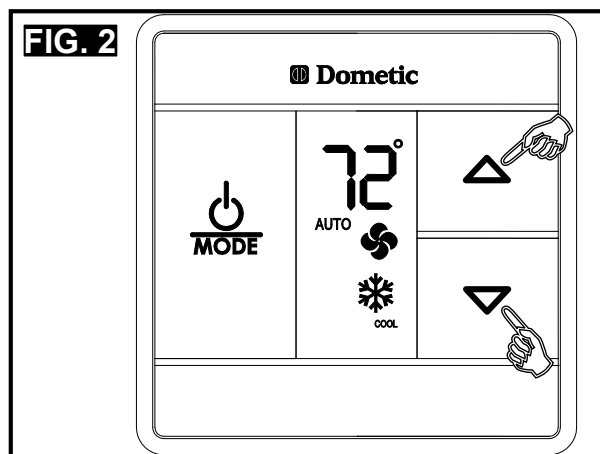
PROGRAMMING AND OPERATION

A. On / Off

1. To turn On the CT thermostat, press / **Mode** button. To turn Off the CT thermostat press the / **Mode** button and toggle through modes until Off is shown in lower right hand of LCD. LCD will remain backlit for approximately 15 seconds, then go out.

B. Temperature Format °F / °C

1. Simultaneously press the and buttons to toggle between Fahrenheit and Centigrade format. See (FIG. 2).

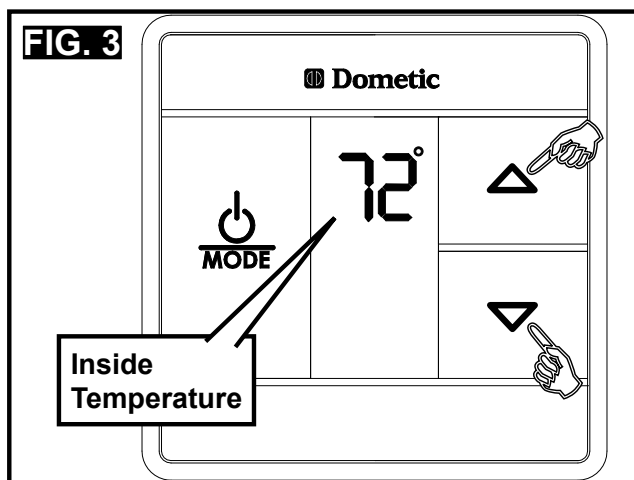




PROGRAMMING AND OPERATION

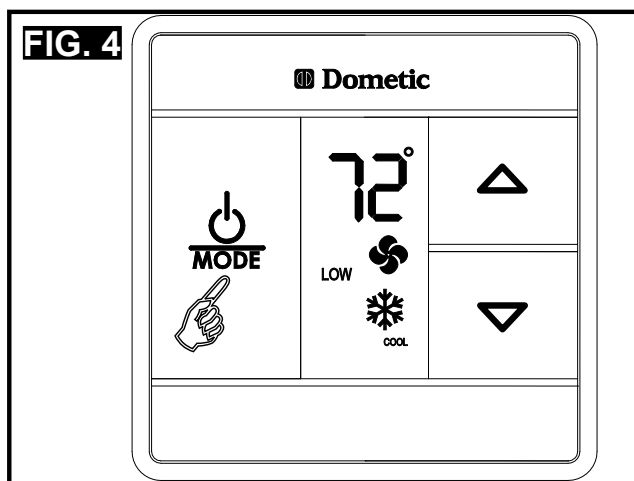
C. Inside Temperature

1. To display the Inside Temperature, CT thermostat must be in Off Mode. Press either Δ or ∇ button to display the Inside Temperature. See (FIG. 3).



D. Mode Selection

1. Press ⏻ / **Mode** button to advance through available modes. Each successive press will advance to next available mode. See (FIG. 4).
Dependent upon systems installed, options will be Off, Fan, Cool, Furnace, Heat Pump, or Heat Strip. See "Mode Description" on page (7) for more information.

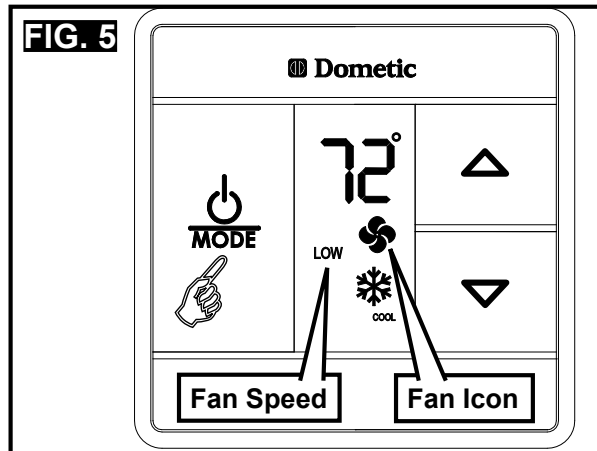




PROGRAMMING AND OPERATION

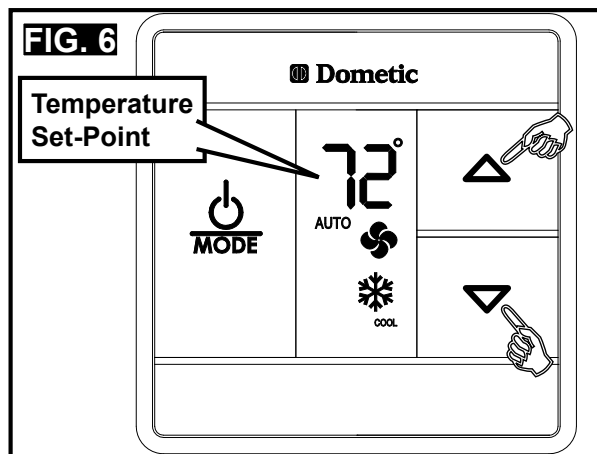
E. Fan Speed

1. Press **⏻ / Mode** button until Fan icon appears. See (FIG. 5). The LCD will show “Low”, “High”, or “Auto”. Press the **▲** or **▼** button to select desired fan speed. See “B. Auto Fan” on page (8) for more information.



F. Temperature Set-Point

1. Press **⏻ / Mode** button to change the mode (Cool / Furnace / Heat Pump / Heat Strip) to adjust temperature set-point of selected mode. Temperature set-point is indicated by two digits on LCD. Press **▲** to increase or **▼** to decrease temperature. The maximum set-point for the system is 90°F. The minimum set point is determined by active operating mode. For heating, the minimum is 40°F and minimum for cooling is 55°F. See (FIG. 6).





MODE DESCRIPTION

A. “Off” - Off Mode

1. When selected, Off will appear in the lower right hand corner of LCD. The LCD will remain backlit for 15 seconds, then turn off.

B. “Cool” - Cool Mode

1. In Cool Mode, system will cycle compressor On and Off based on room air temperature and temperature set-point on CT thermostat. Fan will turn on first, followed by the compressor approximately 2 minutes later. There are 3 fan speeds in Cool Mode.
 - a. “Low”: Fan operates continuously at low speed. The compressor cycles On and Off.
 - b. “High”: Fan operates continuously at high speed. The compressor cycles On and Off.
 - c. “Auto”: Fan speed will vary depending on difference between the temperature set-point and room air temperature. The compressor and the fan will cycle On and Off with thermostat. See “B. Auto Fan” on page (8) for more information.

C. “Furnace” - Furnace Mode

1. There are 3 fan speeds in Furnace Mode.
 - a. “Low”: Fan operates continuously at low speed.
 - b. “High”: Fan operates continuously at high speed.
 - c. “Auto”: Fan is Off.



If additional indoor air circulation provided by the air conditioner is **NOT** desired during Furnace Mode of operation, select “Auto” in the Fan Mode to shut the air conditioner fan off. If “Low” or “High” is selected, the air conditioner fan will continue to operate at selected speed.

2. In Furnace Mode system will cycle RV furnace On and Off based on room air temperature and temperature set-point on CT thermostat. CT thermostat can be configured to operate using an On / Off differential of either 1°F or 2°F. This feature is programmed during the system initialization. See “B. System Initialization” on page (3).
3. To set temperature differential, system must be Off. Press ▼ button and simultaneously press and hold ⏻ / **Mode** button for three seconds. Press ▲ button to toggle between “d1” and “d2”, “d1” for 1°F differential and “d2” for 2°F differential.

D. “Heat Pump” - Heat Pump Mode (Select Models)

1. In Heat Pump Mode, system will cycle compressor On and Off based on room air temperature and temperature set-point on CT thermostat. When system calls for heating there will be a delay of approximately 2 minutes. There are 3 fan speeds in Heat Pump Mode.
 - a. “Low”: Fan operates continuously at low speed. The compressor cycles On and Off.
 - b. “High”: Fan operates continuously at high speed. The compressor cycles On and Off.



MODE DESCRIPTION

- c. "Auto": Fan speed will vary depending on difference between the temperature set-point and room air temperature. The compressor and the fan will cycle On and Off with thermostat. Compressor shuts off first followed by fan in approximately 15 seconds. See "B. Auto Fan" on page (8) for more information.
2. This mode of operation is a customer option usually selected when temperatures are below 70°F and customer needs warmth in living space rather than cool down. This reverses refrigerant flow in the air conditioner, causing warm air to be dispensed inside rather than cold, and cold air is dispensed outside rather than warm.
3. This mode of operation can cause a dilemma where the outside coil, which is now dispensing cold air can freeze up due to cold air blowing across the coil mixed with outside temperature. A system freeze up can render heat pump inoperable. There is a defrost feature that will prevent this from happening. See "D. Defrost Cycle" on page (9) for more information.

E. "Heat Strip" - Heat Strip Mode (Select Models)

1. In Heat Strip Mode, system will cycle heat strip On and Off based on room air temperature and temperature set-point on CT thermostat. There are 3 fan speeds in Heat Strip Mode.
 - a. "Low": Fan operates continuously at low speed. Heat strip cycles On and Off.
 - b. "High": Fan operates continuously at high speed. Heat strip cycles On and Off.
 - c. "Auto": Fan operates in low speed and will cycle On and Off with thermostat.


F. "Fan" - Fan Mode


1. There are 3 fan speeds in Fan mode.
 - a. "Low": Fan operates continuously at low speed.
 - b. "High": Fan operates continuously at high speed.
 - c. "Auto": Fan is Off.

SPECIAL FEATURES

A. Capacitive Touch Interface

The capacitive touch interface provides a clean, modern user interface.

 Capacitive touch interface requires skin contact to function, therefore it will **NOT** work through gloves, bandages, etc...

 Moisture, including wet fingers, on the capacitive touch interface can cause sensors to become unresponsive until the water evaporates.

B. Auto Fan

When auto fan is selected fan speed will vary depending on room temperature and temperature set-point. In auto fan compressor and fan cycle On and Off with thermostat.

When difference is:

- | | |
|-------|----------------------|
| > 5°F | Fan operates on HIGH |
| < 4°F | Fan operates on LOW |



SPECIAL FEATURES

C. Compressor Time Delay

A time delay of approximately 2 minutes occurs anytime compressor is required to begin cooling or heat pump cycle.

D. Defrost Cycle

During heat pump operation, if outside coil begins to freeze up, a defrost cycle is initiated that temporarily puts heat pump back into air conditioning mode. This reverses the refrigerant flow and melts ice forming on outside coil. Typically this occurs when outside temperatures are below 42°F and repeats every 25 minutes of compressor run time. During this cycle the unit will cease to provide hot air flow temporarily. This is normal and is **NOT** an indication of malfunction.



Defrost cycling **SHALL** continue until measured temperature of Outside Sensor is $\leq 30^{\circ}\text{F}$ or $\geq 42^{\circ}\text{F}$.

E. Low Ambient Heat Pump Lock Out

All heat pumps are constrained to operation at a temperature range determined by outside conditions. Since all heat pumps lose efficiency at low outside ambient temperatures, the heat pump has a lock out feature that prevents heat pump mode of operation when temperatures fall below 30°F. If system is set in Auto Mode fan will be turned OFF. Fan will remain ON if fan setting is set to Low or High, however compressor will not run and there will be no heat function below 30°F.

F. Power Interruption

In the event power to air conditioner or control is interrupted, system will restart with previous set-points once power is restored.

G. LCD Error Code

When system determines one of the faults listed has occurred, an error code will be displayed on LCD.

Error Code:

- E1 Loss of communication between CT thermostat and module board. LCD will cycle between E1 and previous mode setting. System will shut down.
- E2 Open circuit or out of range Indoor Temperature Sensor. Heating and cooling operation will be locked out. Fan operation can continue to operate.
- E3 Shorted Indoor Temperature Sensor. Heating and cooling operation will be locked out. Fan operation can continue to operate.
- E4 Open circuit or out of range Outdoor Temperature Sensor (select models). Heat Pump operation will be locked out. Air Conditioner, Fan, and Furnace operation can continue to operate.
- E5 Open Circuit or out of range Freeze Sensor. Air Conditioner mode of operation will be locked out, but displays the last temperature set-point.



GENERAL INFORMATION

A. Frost Formation On Cooling Coil

1. Frost on a small portion of the coil is not unusual. Under certain conditions, ice may form on the evaporator coil. This is indicated by very cold output at very low air speed and the icing can be seen through the air inlet hole with the filter removed. If this should occur, inspect the filter and clean if dirty. Make sure air vents are open and not obstructed. Units have a greater tendency to frost when the outside temperature is relatively low. This may be prevented by adjusting the thermostat set-point to a warmer temperature. Should frosting continue, operate on any FAN ONLY setting until the cooling coil is free of frost; then resume normal operation. If frost condition persist, contact your local service center for assistance.

B. Heat Gain

The ability of this air conditioner to maintain the desired inside temperature depends on the heat gain of the RV.

Some preventative measures taken by the occupants of the RV can reduce the heat gain and improve the performance of the air conditioner. During extremely high outdoor temperatures, the heat gain of the RV may be reduced by:

1. Parking the RV in a shaded area
2. Using window shades (blinds and/or curtains)
3. Keeping windows and doors shut or minimizing usage
4. Avoiding the use of heat producing appliances

Operation on High Fan/Cooling mode will give optimum or maximum efficiency in high humidity or high outside temperatures.

Starting the air conditioner early in the morning and giving it a “head start” on the expected high outdoor ambient will greatly improve its ability to maintain the desired indoor temperature.

For a more permanent solution to high heat gain, accessories like Dometic outdoor patio and window awnings will reduce heat gain by removing the direct sun. They also add a nice area to enjoy company during the cool of the evening.

C. Condensation

The manufacturer of this unit will not be responsible for damage caused by condensation forming on ceilings, windows, or other surfaces. Air contains water vapor which condenses when temperature of a surface is below Dew point. During normal operation this unit is designed to remove a certain amount of moisture from the air, depending on the size of the space being conditioned. Keeping doors and windows closed when this air conditioner is in operation will greatly reduce the chance of condensation forming on interior surfaces.



MAINTENANCE


A. Air Filter


1. Periodically (a minimum of every 2 weeks of operation) remove the return air filter located behind the return air vent grille and wash it with soap and warm water, let dry and then reinstall.

 **NEVER** run unit without return air filter in place. This will plug the unit evaporator coil with dirt and may substantially degrade the performance of the unit over time.

B. CT Thermostat

1. Clean CT thermostat with a dry soft cloth.

 Do **NOT** spray water directly on CT thermostat. Do **NOT** use solvents for cleaning.

 If a moist soft cloth is needed to clean the CT thermostat surface, the sensors may become unresponsive. If this happens, it will be necessary to allow the water enough time to evaporate for sensors to regain responsiveness.

SERVICE - UNIT DOES NOT OPERATE

If your unit fails to operate or operates improperly, check the following before calling your service center.

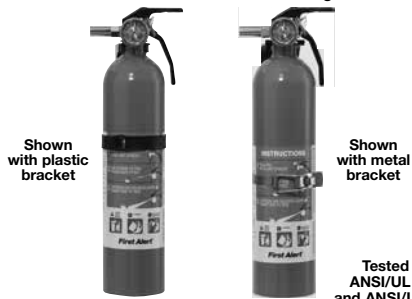
- If RV connected to motor generator, check to be sure motor generator is running and producing power.
- If RV connected to power supply by a land line, check to be sure line is sized properly to run unit load and it is plugged into power supply.
- Check your fuse or circuit breaker to see if it is open. Insure fuse is not burnt, or circuit breaker is "ON" and not activated.
- After the above checks, call your local service center for further help. This unit must be serviced by qualified service personnel only.

When calling for service, always give the following:

- Unit model and serial number found on the identification label located on base pan of unit bottom. Return air vent grille must be removed from ADB to view.
- ADB model and serial number found on rating plate located on ceiling template. Observe this rating plate through the filter opening.



First Alert® User's Manual Dry Chemical Fire Extinguisher



Printed in Mexico
M08-0137-008 M 05/11

Tested to
ANSI/UL 711
and ANSI/UL 299
Models FE5GR,
FE10GR, FE1A10GR

IMPORTANT! Please read carefully and save.

This user's manual contains important information about your fire extinguisher's operation. If you are installing this fire extinguisher for use by others, you must leave this manual—or a copy of it—with the end user.

Read extinguisher label and the entire user's manual carefully before installing or using the unit. Make sure everyone in your household is completely familiar with the operation of the extinguisher, and review the instructions regularly. In an emergency, you will not have time to read instructions.

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3901 Liberty Street Road, Aurora, IL 60504-8122
Consumer Affairs: (800) 323-9005 • www.firstalert.com

Thank you for choosing First Alert® for your fire extinguisher needs. You have purchased a high quality fire extinguisher designed to protect you and your family in case of a fire danger.

IMPORTANT INFORMATION ABOUT FIRE EXTINGUISHERS

NOTE: Be sure the extinguisher is rated to fight the type of fire most likely to occur in the area you choose to install it. Since household fires commonly start in the kitchen, you should always install an extinguisher in the kitchen. For added security, you should also install additional extinguishers in utility areas, and other living areas in your household.

Fire extinguishers are classified by fire type. The A, B and C rating system defines the kinds of burning materials each fire extinguisher is designed to fight. The numbers in front of the A, B, or C indicate the rating for size of the fire the unit can extinguish. Using the wrong type of fire extinguisher can do more harm than good. Make sure you understand which fire extinguisher to use on each class of fire!



Class A rating: The agent/powder is suitable for fighting small fires involving wood, paper, cloth, rubber, and some plastics.

Class B rating: The agent/powder is suitable for fighting small fires involving grease, oil, gasoline, kerosene, and other flammable liquids.

Class C rating: The agent/powder is suitable for fighting small fires in "live" electrical equipment.

FE5GR is rated Class 5-B:C.

FE10GR is rated Class 10-B:C.

FE1A10GR is rated Class 1-A:10-B:C.

READ BEFORE INSTALLING OR USING THIS FIRE EXTINGUISHER!

⚠ DANGER!

- This extinguisher is designed for use against small fires that have just started and are small enough to fight safely. It is not designed to fight large fires that are burning out of control. If the fire is too hot or smoky for you to get within 6 feet (2 meters) of it, do not try to fight it yourself. Warn everyone, evacuate the premises, and have someone call the Fire Department from outside the building. Trying to fight a large fire yourself can result in injury or death.
- Do not puncture or burn any fire extinguisher. The contents are under pressure, and the extinguisher could explode.
- Never locate this extinguisher close to an engine, stove or other source of heat. It is pressurized and could rupture or explode if exposed to temperatures over 150° F (66° C).

⚠ CAUTION!

- This extinguisher contains a dry powder extinguishing agent. The agent/powder is nontoxic, but can irritate skin. When using this unit, avoid breathing the powder. Always ventilate the area after use.

WHERE TO INSTALL THIS EXTINGUISHER

A Fire Extinguisher Should Be Mounted:

- In the vicinity of (but not on or in) a potential source of heat and/or fire, like an oven or stove.
- Where it is easy to reach, near an exit or an escape route from the room.
- In a location that is convenient, in plain sight, and 3-1/2 to 5 feet (1 to 1.5 meters) above the floor.
- Store the extinguisher high enough to keep it out of the reach of small children.
- On a clean, dry surface where the temperature does not go above 120° F (49° C) or below -40° F (-40° C).

HOW TO INSTALL THIS EXTINGUISHER

⚠ CAUTION!

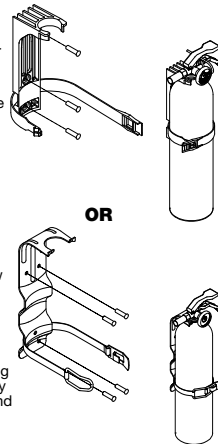
- Do not mount the extinguisher on drywall or plaster without adequate support. Use strong screws or bolts to mount the bracket securely into solid wood or metal that can support it, like a wooden partition stud. Secure mounting is needed so you can remove the extinguisher quickly and easily in an emergency. Also, if the extinguisher is not held securely, it could drop to the floor and injure people or damage the extinguisher.
- DO NOT BREAK THE SAFETY SEAL!** This seal prevents accidental discharge of the fire extinguisher. Break the seal only in an emergency before using the fire extinguisher.

INSTALL THE MOUNTING BRACKET ON A WALL

- The extinguisher has a bracket for wall mounting.
- Install the mounting bracket on a wooden stud or other solid surface that will support the weight of the extinguisher using the screws or bolts you purchased.

NOTE: Since wall surface types vary, **mounting screws are not included.** Purchase screws or bolts specifically designed for the surface on which you will mount the fire extinguisher. The fire extinguisher label lists its maximum weight. Mounting screw head type should be #8 pan on round head screws with #8 flat washers.

- After installing the mounting bracket, replace the extinguisher on the bracket with the label facing outward, so the label can be easily read. Wrap the bracket strap around the cylinder and snap the buckle closed.



INSTALLING THE MOUNTING BRACKET IN A MARINE CRAFT

According to the NFPA Standard 302 (Fire protection Standard for Pleasure and Commercial Motor Craft):

- On marine craft, portable fire extinguishers shall be located to be readily accessible. Extinguishers shall be secured with a marine bracket to permit immediate release.
- On marine craft, extinguisher agent cylinders shall be mounted a minimum of 2 inches (5 cm) above moist or wet surfaces to reduce the danger of corrosion.

CHECKING AND INSPECTING THE FIRE EXTINGUISHER

⚠ WARNING!

- DO NOT CHECK THE PRESSURE OR TEST THE FIRE EXTINGUISHER BY SQUEEZING THE LEVER, EVEN BRIEFLY. ONCE USED, IT WILL GRADUALLY LOSE PRESSURE AND WILL NOT BE FULLY CHARGED FOR USE IN AN EMERGENCY.**
- When the pointer drops into the red area, the extinguisher may still be pressurized, but must be recharged.

- Inspect the extinguisher once a week. Remove the extinguisher from the mounting bracket and inspect the gauge. If the yellow pointer is in the GREEN area, the extinguisher is properly pressurized and ready to use. If the pointer drops into the RED area, the extinguisher has lost some pressure and should be replaced.
- Check for signs of damage or misuse. Make sure you can still read all the text on the label. Carefully examine the surface of the extinguisher for corrosion. You can help prevent corrosion by cleaning the extinguisher if it gets wet or dirty. If you notice corrosion during the warranty period, return the unit to First Alert® (see "Limited Warranty" at the end of this manual).
- Make sure the tamper indicator ("safety seal") is still intact and the nozzle is clean and unobstructed.
- When you finish inspecting the extinguisher, always put it back securely into the mounting bracket.

IMPORTANT!

For more information about fire extinguishers, consult the NFPA Standard #10, "Portable Fire Extinguishers," available from the National Fire Protection Association, Inc., Batterymarch Park, Quincy, MA 02169, USA.



FIRST ALERT FIRE EXTINGUISHER

HOW TO OPERATE YOUR FIRE EXTINGUISHER IN A FIRE EMERGENCY

⚠ DANGER!

- Make sure your extinguisher may be safely and effectively used on the small fire you want to fight. Always use extreme caution when fighting any fire. Fight a fire only where there is a clear escape path to allow you to get out safely if the fire gets worse.

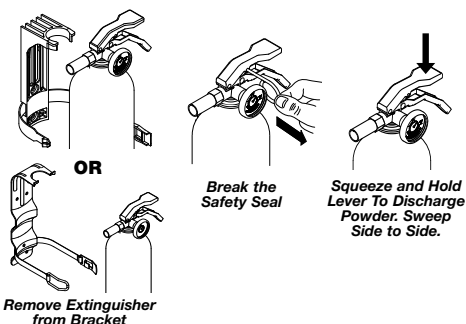
⚠ WARNING!

- Avoid breathing smoke and heated fumes; stay low if necessary. Burning materials will release toxic fumes. Inhaling these fumes may cause injury or death.

⚠ CAUTION!

- Always stand back far enough away from the fire—near an exit—and make sure nothing is between you and your escape route. If you get too close to a fire, you risk getting burned or hit by splattering material like grease. If the fire is too hot or smoky for you to get within 6 feet (2 meters), DO NOT try to fight the fire yourself. Evacuate immediately and call the Fire Department.
- For fires on a kitchen stove, turn oven or burners off immediately if possible. If you can't reach the oven or burner controls safely, extinguish the fire first, then turn them off.
- Fight the fire from an upwind direction with your back to any strong air current. Trying to fight a fire with currents blowing towards you can result in serious injury.

TO FIGHT THE FIRE



1. Remove the extinguisher from the mounting bracket.
2. Hold the unit firmly with the nozzle facing away from you. Pull out the pin to break the "Safety Seal". You won't be able to squeeze the lever until the safety seal is removed.
3. Stand back 6 feet (2 meters) from the fire and make sure the fire is not between you and your exit.
4. Hold the extinguisher upright and aim the nozzle at the base of the fire.
5. Squeeze and hold the lever to discharge the powder.
6. Sweep the spray at the base of the burning material, using quick side-to-side motions. (If the spray scatters the fire, move back.)
7. Move slowly towards the fire as the extinguisher spray pushes the fire back. Maintain a 6-foot (2 meter) distance between you and the front of the fire at all times.
8. Completely discharge the contents of the extinguisher and make sure the fire is completely out. Flashbacks are common with fires.
9. For kitchen fires on a kitchen stove, turn off the stove immediately if possible, otherwise as soon as it is safe.
10. If you suspect a fire had an electrical origin, shut off the electrical power, if possible, without eliminating your escape route. Do not touch electrical wires or appliances.
11. After you have completely discharged your extinguisher, leave the building and close all the doors behind you.

AFTER THE FIRE IS EXTINGUISHED

⚠ DANGER!

Do not turn the electrical power back on or plug in any appliances until the area has been cleaned up completely. It is very important to remove the powder from electrical equipment after a fire. If the powder gets wet, it can conduct electricity. (Using a dry chemical extinguisher on wet electrical equipment may be hazardous for this reason.) This may worsen an electrical leakage problem, impair the equipment's insulation, or create an electrical shock hazard.

If the fire was on a kitchen stove:

- Make sure the oven and all burners are turned off.
- Clean up the powder completely before using the stove or oven. See "How to Clean After Using a Fire Extinguisher". Ventilate the area thoroughly.

If you think the fire had an electrical origin:

- Shut off the electrical power, if possible--do not touch any electrical wires or appliances.
- Leave the building and close all doors behind you. Call the Fire Department and have them inspect the premises. As soon as they say it's safe to return, ventilate the area thoroughly.
- Have a licensed electrician inspect your electrical system. Do not turn the power back on or plug in any electrical equipment until the inspection has been completed.

HOW TO CLEAN AFTER USING A FIRE EXTINGUISHER

NOTE: The powder spray from the extinguisher may spread over a wide area, and may soil upholstery, carpets and walls.

- Sweep/vacuum up as much of the powder as possible. Then use a damp cloth to wipe off the remaining agent.
- If you have any questions about cleaning appliances that the agent has come into contact with, please contact the appliance manufacturer.

IF YOUR EXTINGUISHER NEEDS SERVICE

This fire extinguisher is rechargeable by a certified fire equipment dealer, regardless of how much of the content was used.

Once a year, a certified fire equipment dealer, in accordance with the service manual identified on the fire extinguisher label, should service the fire extinguisher. Please refer to your local telephone directory for a certified dealer.

⚠ CAUTION!

Do not try to service or repair this fire extinguisher under any circumstances. Do not try to remove the nozzle or valve assembly. This is a pressurized device that can cause serious injury if tampered with.

If there is a problem and it is still under warranty, please see "How to Obtain Warranty Service" in the Limited Warranty.

DISPOSING OF A USED EXTINGUISHER

If you choose not to have a used extinguisher refilled or a non-working unit repaired, take it outdoors, turn it upside down, and discharge it completely. Dispose of the empty unit properly, and replace it with a new fire extinguisher.

⚠ DANGER!

Never puncture, burn or expose this fire extinguisher to temperatures over 150° F (66° C) even if it is fully discharged. The contents are under pressure and it could explode.

LIMITED WARRANTY

BRK Brands, Inc. ("BRK") the maker of First Alert® brand products, warrants that for a period of ten years from the date of purchase, this product will be free from defects in material and workmanship. BRK, at its option, will repair or replace this product or any component of the product found to be defective during the warranty period. Replacement will be made with a new or remanufactured product or component. If the product is no longer available, replacement may be made with a similar product of equal or greater value. This is your exclusive warranty.

This warranty is valid for the original retail purchaser from the date of initial retail purchase and is not transferable. Keep the original sales receipt. Proof of purchase is required to obtain warranty performance. BRK dealers, service centers, or retail stores selling BRK products do not have the right to alter, modify or any way change the terms and conditions of this warranty.

This warranty does not cover normal wear or damage resulting from any of the following: negligent use or misuse of the product, use on improper voltage or current, use contrary to the operating instructions, disassembly, repair or alteration by anyone other than BRK or an authorized service center. Further, the warranty does not cover acts of God, such as fire, flood, hurricanes and tornadoes.

BRK shall not be liable for any incidental or consequential damages caused by the breach of any express or implied warranty. Except to the extent prohibited by applicable law, any implied warranty of merchantability or fitness for a particular purpose is limited in duration to the duration of the above warranty. Some states, provinces, or jurisdictions do not allow the exclusion or limitation of incidental or consequential damages or limitations on how long an implied warranty lasts, so the above limitations or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that vary from state to state, or province to province.

How to Obtain Warranty Service

Service: If service is required, do not return the product to your retailer. In order to obtain warranty service, contact the Consumer Affairs Division at 1-800-323-9005, 7:30 AM to 5:00 PM, Central Standard Time, Monday through Friday. To assist in serving you, please have the model number and date of purchase available when calling.

Address: 25 Spur Drive, El Paso, TX 79906

Marine Type, U.S.C.G. Type B:C, Size I
U.S.C.G. Approval Number 162.028/EX3622
Valid only with Bracket Number P87-0340
or Bracket Number B70-0161 and Strap Number S70-0007.
Bracket included.

First Alert® is a registered trademark of the First Alert Trust.



USER'S MANUAL COMBINATION SMOKE & CARBON MONOXIDE ALARM

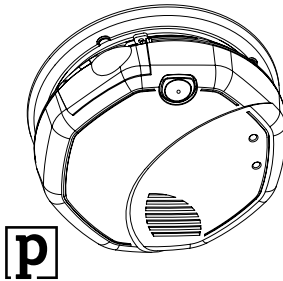


Separate sensors to detect smoke and CO; the two alarm systems work independently

Powered by two "AA" batteries

Side access drawer for easy batter replacement

Certified to ULC Std. S531, UL Std 217, CSA Std 6.19-06



IMPORTANT! PLEASE READ CAREFULLY AND SAVE.

This user's manual contains important information about your Combination Smoke & Carbon Monoxide Alarm's operation. If you are installing this Alarm for use by others, you must leave this manual – or a copy of it – with the end user.

Printed in Mexico
M08-152697-165052_SCO5RVA_1039339 K1 9/18

Model SCO5RVA

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All First Alert® and BRK® Smoke Alarms conform to regulatory requirements, and are designed to detect particles of combustion. Smoke particles of varying number and size are produced in all fires.



Ionization technology is generally more sensitive than photoelectric technology at detecting small particles, which tend to be produced in greater amounts by flaming fires, which consume combustible materials rapidly and spread quickly. Sources of these fires may include paper burning in a wastebasket, or a grease fire in the kitchen.



Photoelectric technology is generally more sensitive than ionization technology at detecting large particles, which tend to be produced in greater amounts by smoldering fires, which may smolder for hours before bursting into flame. Sources of these fires may include cigarettes burning in couches or bedding.

For maximum protection, use both types of Smoke Alarms on each level and in every bedroom of your home.

INTRODUCTION FIRE SAFETY TIPS

Follow safety rules and prevent hazardous situations: 1) Use smoking materials properly. Never smoke in bed. 2) Keep matches or lighters away from children; 3) Store flammable materials in proper containers; 4) Keep electrical appliances in good condition and don't overload electrical circuits; 5) Keep stoves, barbecue grills, fireplaces and chimneys grease- and debris-free; 6) Never leave anything cooking on the stove unattended; 7) Keep portable heaters and open flames, like candles, away from flammable materials; 8) Don't let rubbish accumulate.

Keep alarms clean, and test them weekly. Replace alarms immediately if they are not working properly. Smoke Alarms that do not work cannot alert you to a fire. Keep at least one working fire extinguisher on every floor, and an additional one in the kitchen. Have fire escape ladders or other reliable means of escape from an upper floor in case stairs are blocked.

BASIC SAFETY INFORMATION IMPORTANT!

- Dangers, Warnings, and Cautions alert you to important operating instructions or to potentially hazardous situations. Pay special attention to these items.

CAUTION!

- This combination Smoke/Carbon Monoxide Alarm has two separate alarms. This CO sensor is designed to detect carbon monoxide gas from any source; it is not designed to detect any other gases. It will only indicate the presence of carbon monoxide gas at the sensor. Carbon monoxide gas may be present in other areas. The Smoke Alarm will only indicate the presence of smoke that reaches the sensor. The smoke sensor is not designed to sense gas, heat or flames.

WARNING!

- This Smoke/CO Alarm cannot operate without working batteries. Removing the batteries for any reason, or failing to replace the batteries at the end of their service life, removes your protection.
- Never Ignore any alarm. See "If Your Smoke/CO Alarm Sounds" for more information on how to respond to an alarm. Failure to respond can result in Injury or death.
- The Silence Features are for your convenience only and will not correct a problem. See "Using the Silence Features" for details. Always check your home for a potential problem after any alarm. Failure to do so can result in Injury or death.
- Test this Smoke/CO Alarm once a week. If the Alarm ever fails to test correctly, have it replaced immediately! If the Alarm is not working properly, It cannot alert you to a problem.
- This device is designed to protect individuals from the acute effects of carbon monoxide exposure. It will not fully safeguard individuals with specific medical conditions. If in doubt consult a medical practitioner. Individuals with medical conditions that may make them more sensitive to carbon monoxide may consider using warning devices which provide audible and visual signals for carbon monoxide concentrations under 30 ppm.

INSTALLATION

WHERE TO INSTALL THIS ALARM

This carbon monoxide alarming device is designed to detect carbon monoxide gas from ANY source of combustion. It is NOT designed to detect smoke, fire, or any other gases.

For minimum security, a combination Smoke/CO Alarm should be centrally located outside of each separate sleeping area in the immediate vicinity of the bedrooms. For more security, install additional Alarms in each separate bedroom. The Alarm should be located at least 100 mm (4 inches) from all exterior walls and at least 914 mm (36 inches) from supply or return vents.

For additional protection, install residential combination Smoke/CO Alarms:

- On every level of your home, including finished attics and basements.
- Inside every bedroom, especially if people sleep with the door partly or completely closed.
- In the hall near every sleeping area. If your home has multiple sleeping areas, install a unit in each. If a hall is more than 12 meters (40 feet) long, install a unit at each end.
- At the top of first-to-second floor stairway, and at the bottom of the basement stairway.
- For additional coverage, install Alarms in all rooms, halls, and storage areas, where temperatures normally remain between 4° C and 38° C
- (40° F and 100° F).

RECOMMENDED RESIDENTIAL PLACEMENT

RECOMMENDED PLACEMENT:



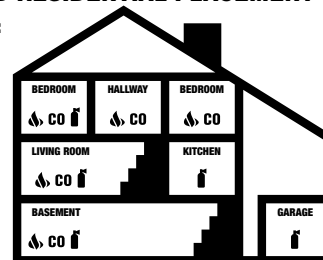
Smoke Alarm
One on every level and in every bedroom



Carbon Monoxide Alarm
One on every level and in every bedroom



Fire Extinguisher
One on every level, plus kitchen and garage



- When installing on the wall, the top edge of Smoke Alarms should be placed between 102 mm (4 inches) and 305 mm (12 inches) from the wall/ceiling line.
- When installing on the ceiling, place the alarm as close to the center as possible.
- In either case, install at least 102 mm (4 inches) from where the wall and ceiling meet. See "Avoiding Dead Air Spaces" for more information.

Note: For any location, make sure no door or other obstruction could keep carbon monoxide or smoke from reaching the alarm.

WHERE TO INSTALL THIS ALARM IN RECREATIONAL VEHICLES

Install CO Alarms on inside or insulated walls and ceilings ONLY. Uninsulated outside walls and roofs of RV's often transfer heat and cold from outdoors. The Alarm should be located at least 152 mm (6 inches) from all the exterior walls and at least 305 mm (12 inches from supply or return vents).

WARNING!

Test units used in RV's after the vehicle has been in storage, before each trip, and once a week while in use. Failure to test units used in RV's as described may remove your protection.

WHERE THIS ALARM SHOULD NOT BE INSTALLED

DO NOT PLACE THE ALARM:

- In garages, kitchens, furnace rooms, or in any extremely dusty, dirty or greasy areas.
- Within 1.5 meters (5 feet) of any cooking appliance.
- In extremely humid areas. This alarm should be at least 3 meters (10 feet) from a bath or shower, sauna, humidifier, vaporizer, dishwasher, laundry room, utility room or other source of high humidity.
- In areas where temperature is colder than 4.4° C (40° F) or hotter than 37.8° C (100° F). These areas include unconditioned crawl spaces, unfinished attics, uninsulated or poorly insulated ceilings, porches, and garages.
- In turbulent air, like near ceiling fans, heat vents, air conditioners, fresh air returns, or open windows. Blowing air may prevent CO from reaching the sensors.
- Outside the Mobile Home.
- In direct sunlight.
- In insect infested areas. Insects can clog the openings to the sensing chamber and cause unwanted alarms.
- Less than 305 mm (12 inches) away from florescent lights. Electrical "noise" can interfere with the sensor.
- In "dead air" spaces. See "Avoid Dead Air Spaces."

AVOIDING DEAD AIR SPACES

"Dead air" spaces may prevent smoke from reaching the Smoke/CO Alarm. To avoid dead air spaces, follow installation recommendations below.

On ceilings, install Smoke/CO Alarms as close to the center of the ceiling as possible. If this is not possible, install the Smoke/CO Alarm at least 102 mm (4 inches) from the wall or corner

For wall mounting (if allowed by building codes), the top edge of Smoke/CO Alarms should be placed between 102 mm (4 inches) and 305 mm (12 inches) from the wall/ceiling line, below typical "dead air" spaces.

On a peaked, gabled, or cathedral ceiling, install first Smoke/CO Alarm within 0.9 meters (3 feet) of the peak of the ceiling, measured horizontally. Additional Smoke/CO Alarms may be required depending on the length, angle, etc. of the ceiling's slope.



FIRST ALERT SMOKE/CO DETECTOR

WHERE CO ALARMS SHOULD NOT BE INSTALLED IN RECREATIONAL VEHICLES

DO NOT LOCATE THIS SMOKE/CO ALARM:

- Outside the RV.
- Within 1.5 meters (5 feet) of any cooking appliance.
- In extremely humid areas. Avoid installing in close proximity to a bath or shower or other source of high humidity.
- In locations where the temperatures are regularly below -40° C (-40°F) or above 66° C (150° F).
- In turbulent air, like near ceiling fans, heat vents, air conditioners, fresh air returns, or open windows. Blowing air may prevent CO from reaching the sensors.

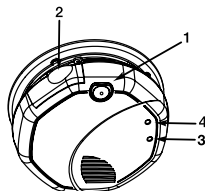
HOW TO INSTALL THIS ALARM IMPORTANT!

This combination Smoke/CO Alarm was designed to be mounted on the ceiling or wall. It is not a tabletop device. You must install this device on the ceiling or wall as outlined below. Read "Where To Install This Alarm" before starting.

PARTS OF THIS SMOKE/CO ALARM

1. Test/Silence Button
2. Battery Compartment
3. Power/Smoke Alarm LED
4. CO Alarm LED

Tools you will need: pencil, drill with 5mm or 3/16" drill bit, flathead screwdriver, hammer.



CAUTION!

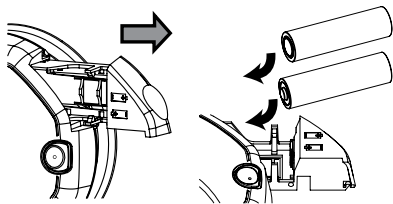
- Do not connect this unit to any other alarm or auxiliary device. It is a single-station unit that cannot be linked to other devices. Connecting anything else to this unit may prevent it from working properly.
- Do not install this unit over an electrical junction box. Air currents around junction boxes can prevent smoke from reaching the sensing chamber and prevent the unit from alarming. Only AC powered units are intended for installation over junction boxes.

IMPORTANT!

If you want to lock the battery compartment, or lock the Smoke/CO Alarm to the mounting bracket, please read the "Optional Locking Features" section.

1. Hold base firmly and twist the mounting bracket counterclockwise (left) to separate it from the unit.
2. Hold the mounting bracket against the ceiling (or wall) so the vertical mounting slot is aligned in the 12 o'clock position and trace around the inside of the mounting slots (vertical and horizontal mounting).
3. Put the unit where it won't get covered with dust when you drill the mounting holes.
4. Using a 5 mm (3/16") drill bit, drill a hole through the center of the oval outlines you traced.
5. Insert the plastic screw anchors (in the plastic bag with screws) into the holes. Tap the screw anchors gently with a hammer, if necessary, until they are flush with the ceiling or wall.
6. Line the mounting bracket up over the plastic screw anchors
7. Screw the mounting bracket to the ceiling or wall through the mounting slots using the two screw provided

8. Before attaching the Alarm to the bracket, insert the two (2) AA batteries (included) into the battery compartment. Match the terminals on the end of the battery with the terminals on the unit. Match "+" to "+" and "-" to "-". If the batteries are not fully inserted, the unit cannot receive battery power.



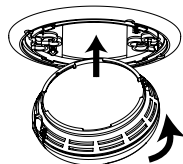
Note: The unit may beep briefly when you install the batteries. This is normal. The GREEN Light flashes about every 60 seconds when the unit is receiving battery power.

WARNING!

The battery door will resist closing unless batteries are installed. This warns you the unit will not operate without batteries.

9. Attach the Smoke/CO Alarm to the mounting bracket. Line up the guides on the alarm's base with the guides on the mounting bracket. When guides are lined up, turn the base clockwise (right) until it snaps into place.

Note: Once the Smoke/CO Alarm is snapped onto the mounting bracket, you can rotate the Smoke/CO Alarm to adjust the alignment.



10. Test the Smoke/CO Alarm. See "Weekly Testing" for details.

REGULAR MAINTENANCE

This unit has been designed to be as maintenance-free as possible but there are a few simple things you must do to keep it working properly.

WARNING!

- Test it at least once a week by pressing the test button of the Smoke/Heat or CO Alarm with which it is interconnected.
- Clean the Smoke/CO Alarm at least once a month; gently vacuum the outside of the Smoke/CO Alarm using your household vacuum's soft brush
- attachment. A can of clean compressed air (sold at computer or office supply stores) may also be used. Follow manufacturer instructions for use. Test the Smoke/CO Alarm. Never use water, cleaners or solvents since they may damage the unit.
- If the Smoke/CO Alarm becomes contaminated by excessive dirt, dust and/or grime, and cannot be cleaned to avoid unwanted alarms, replace the unit immediately.
- Relocate the unit if it sounds frequent unwanted alarms. See "Where This Alarm Should Not Be Installed" for details.

CHOOSING A REPLACEMENT BATTERY:

Your Smoke/CO Alarm requires two standard AA batteries. It was shipped with two AA batteries. The following batteries are acceptable as replacements:

Duracell MN1500. These batteries are available at many local retail stores.

WARNING!

Always use the exact batteries specified by this User's Manual. DO NOT use rechargeable batteries. Clean the battery contacts and also those of the device prior to battery installation. Install batteries correctly with regard to polarity (+ and -).

WARNING!

Please dispose of or recycle used batteries properly, following any local regulations. Consult your local waste management authority or recycling organization to find an electronics recycling facility in your area. DO NOT DISPOSE OF BATTERIES IN FIRE. BATTERIES MAY EXPLODE OR LEAK.

WEEKLY TESTING

WARNING!

- NEVER use an open flame of any kind to test this unit. You might accidentally damage or set fire to the unit or to your home. NEVER use vehicle exhaust! Exhaust may cause permanent damage and voids your warranty.
- DO NOT stand close to the Alarm when the horn is sounding. Exposure at close range may be harmful to your hearing. When testing, step away when horn starts sounding.

CAUTION!

It is important to test this unit every week to make sure it is working properly. Using the test button is the recommended way to test this Smoke/CO Alarm.

Test the Smoke/CO Alarm: press and hold the Test/Silence button 3-5 seconds until unit starts to alarm.

During testing, you will see and hear the following sequence:

- The Horn will sound 3 beeps, pause, 3 beeps. The **Power/Smoke** LED flashes Red and the **CO LED** will be Off.
- NOTE:** For Canada, the Horn will sound 3 beeps, pause, 3 beeps. The **Power/Smoke** LED flashes Red and the **CO LED** will be Off.
- Next the Horn will sound 4 beeps, pause, 4 beeps. The **Power/Smoke** LED will be Off and the **CO LED** flashes Red.

If the unit does not alarm, make sure the batteries are correctly installed, and test again. If the unit still does not alarm, replace it immediately.

WARNING!

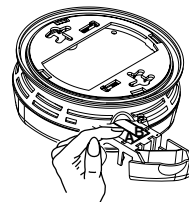
Keep battery out of reach of children. In the event a battery is swallowed, immediately contact your poison control center, your physician, or the National Battery Ingestion hotline at 416-813-5900 as serious injury may occur.

IMPORTANT!

Actual battery service life depends on the Smoke/CO Alarm and the environment in which it is installed. All the batteries specified above are acceptable replacement batteries for this unit. Regardless of the manufacturer's suggested battery life, you MUST replace the battery immediately once the unit starts "chirping" (the "low battery warning").

To replace the batteries (without removing Alarm from the ceiling or wall):

1. Open the battery compartment.
2. Press tabs A and B as shown in the diagram and remove each battery.
3. Insert the new batteries, making sure they snap completely into the battery compartment. Match the terminals on the ends of the batteries with the terminals on the unit.
4. Close the battery compartment, and then test the unit by pressing the Test/Silence button.





IF YOUR SMOKE/CO ALARM SOUNDS WHAT TO DO FIRST – IDENTIFY THE TYPE OF ALARM

Type of Alarm	What You See and Hear
Carbon Monoxide (CO)	CO LED: Flashes Red Horn: 4 beeps, pause, 4 beeps, pause Power/Smoke LED: Off
Smoke	Power/Smoke LED: Flashes Red Horn: 3 beeps, pause, 3 beeps, pause For Canada: Horn: 3 beeps, pause, 3 beeps, pause CO LED: Off

IF THE CO ALARM SOUNDS

⚠WARNING!

Actuation of your CO Alarm indicates the presence of carbon monoxide (CO) which can kill you. In other words, when your CO Alarm sounds, you must not ignore it!

1. Immediately move to fresh air – outdoors or by an open door or window. Do a head count to check that all persons are accounted for. Do not re-enter the premises, or move away from the open door or window until the emergency services responder has arrived, the premises have been aired out, and your CO Alarm remains in its normal condition.
2. Call your emergency services, fire department or 911. Write down the number of your local emergency service here:

"ALARM-MOVE TO FRESH AIR"

If you hear the CO alarm horn and the CO red light is flashing, move everyone to a source of fresh air. DO NOT remove the batteries!

IF THE SMOKE ALARM SOUNDS

RESPONDING TO AN ALARM

⚠WARNING!

- If the unit alarms and you are not testing the unit, it is warning you of a potentially dangerous situation that requires your immediate attention. NEVER ignore any alarm. Ignoring the alarm may result in injury or death.
- Never remove the batteries from a battery operated Smoke/CO Alarm to stop an unwanted alarm (caused by cooking smoke, etc.). Removing batteries disables the alarm so it cannot sense smoke, and removes your protection. Instead open a window or fan the smoke away from the unit. The alarm will reset automatically.
- If the unit alarms get everyone out of the house immediately.

WHAT TO DO IN CASE OF FIRE

- Don't panic; stay calm. Follow your family escape plan.
- Get out of the house as quickly as possible. Don't stop to get dressed or collect anything.
- Feel doors with the back of your hand before opening them. If a door is cool, open it slowly. Don't open a hot door. Keep doors and windows closed, unless you must escape through them.
- Cover your nose and mouth with a cloth (preferably damp). Take short, shallow breaths.
- Meet at your planned meeting place outside your home, and do a head count to make sure everybody got out safely.
- Call the Fire Department as soon as possible from outside. Give your address, then your name.
- Never go back inside a burning building for any reason.
- Contact your Fire Department for ideas on making your home safer.

⚠WARNING!

Alarms have various limitations. See "General Limitations of Smoke/CO Alarms" for details.

USING THE SILENCE FEATURES

⚠WARNING!

Never remove the batteries to quiet an unwanted alarm. Removing the batteries disables the alarm and removes your protection.

The Silence Feature is intended to temporarily silence the horn while you identify and correct the problem. Do not use the Silence Feature in emergency situations. It will not correct a CO problem or extinguish a fire.

The Silence Feature can temporarily quiet an unwanted alarm for several minutes. You can silence this Smoke/CO Alarm: press the Test/Silence button on the alarm cover for at least 3-5 seconds.

After the Test/Silence button is released, the Red LED blinks during the silence mode.

When the Smoke Alarm is Silenced	When the CO Alarm is Silenced
The SmokeAlarm will remain silent for up to 10 minutes, then return to normal operation. If the smoke has not cleared – or continues to increase – the device will go back into alarm.	The CO alarm will remain silent for up to 4 minutes. After 4 minutes, if CO levels remain potentially dangerous the horn will start sounding again.

SILENCING THE LOW BATTERY WARNING

This silence feature can temporarily quiet the low battery warning "chirp" for up to 8 hours. You can silence the low battery warning "chirp": press the Test/Silence button on the alarm cover.

Once the low battery warning "chirp" silence feature is activated, the unit continues to flash the Green light twice a minute for 8 hours. After 8 hours, the low battery "chirp" will resume. **Replace the batteries as soon as possible; this unit will not operate without battery power!**

To deactivate this feature: Press the Test/Silence button again. The unit will go into Test Mode and the low battery warning will resume (LED flashes and unit sounds "chirp" once a minute).

WHAT YOU NEED TO KNOW ABOUT CO

WHAT IS CO?

CO is an invisible, odorless, tasteless gas produced when fossil fuels do not burn completely, or are exposed to heat (usually fire). Electrical appliances typically do not produce CO.

These fuels Include: Wood, coal, charcoal, oil, natural gas, gasoline, kerosene, and propane.

Common appliances are often sources of CO. If they are not properly maintained, are improperly ventilated, or malfunction, CO levels can rise quickly. CO is a real danger now that homes are more energy efficient. "Air-tight" homes with added insulation, sealed windows, and other weatherproofing can "trap" CO inside.'

SYMPTOMS OF CO POISONING

These symptoms are related to CO POISONING and should be discussed with ALL household members.

Mild Exposure: Slight headache, nausea, vomiting, fatigue ("flu-like" symptoms).

Medium Exposure: Throbbing headache, drowsiness, confusion, fast heart rate.

Extreme Exposure: Convulsions, unconsciousness, heart and lung failure. Exposure to Carbon Monoxide can cause brain damage, death.

IMPORTANT!

This CO Alarm measures exposure to CO over time. It alarms if CO levels are extremely high in a short period of time, or if CO levels reach a certain minimum over a long period of time. The CO Alarm generally sounds an alarm before the onset of symptoms in average, healthy adults. Why is this important? Because you need to be warned of a potential CO problem while you can still react in time. Many cases of reported CARBON MONOXIDE POISONING indicate that while victims are aware they are not well, they become so disoriented they are unable to save themselves by either exiting the building or calling for assistance. Also, young children and pets may be the first affected. The average healthy adult might not feel any symptoms when the CO Alarm sounds. However, people with cardiac or respiratory problems, infants, unborn babies, pregnant mothers, or elderly people can be more quickly and severely affected by CO. If you experience even mild symptoms of CO poisoning, consult your doctor immediately!

FINDING THE SOURCE OF CO AFTER AN ALARM

Carbon monoxide is an odorless, invisible gas, which often makes it difficult to locate the source of CO after an alarm. These are a few of the factors that can make it difficult to locate sources of CO:

- House well ventilated before the investigator arrives.
- Problem caused by "backdrafting."
- Transient CO problem caused by special circumstances.

Because CO may dissipate by the time an investigator arrives, it may be difficult to locate the source of CO. **BRK Brands, Inc. shall not be obligated to pay for any carbon monoxide investigation or service call.**

POTENTIAL SOURCE OF CO IN THE HOME

Fuel-burning appliances

like: portable heater, gas or wood burning fireplace, gas kitchen range or cooktop, gas clothes dryer.

Damaged or insufficient

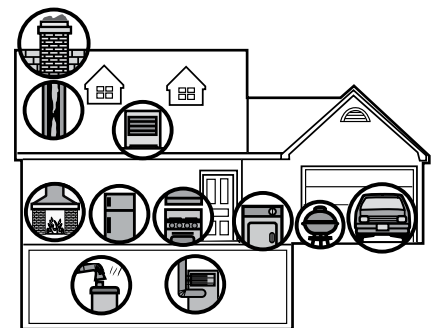
venting: corroded or disconnected water heater vent pipe, leaking chimney pipe or flue, or cracked heat exchanger, blocked or dogged chimney opening.

Improper use of appliance/

device: operating a barbecue grill or vehicle in an enclosed area (like a garage or screened porch).

Transient CO Problems:

"transient" or on-again-off-again CO problems can be caused by outdoor conditions and other special circumstances.



The following conditions can result in transient CO situations:

1. Excessive spillage or reverse venting of fuel appliances caused by outdoor conditions such as:
 - Wind direction and/or velocity, including high, gusty winds. Heavy air in the vent pipes (cold/humid air with extended periods between cycles).
 - Negative pressure differential resulting from the use of exhaust fans.
 - Several appliances running at the same time competing for limited fresh air.
 - Vent pipe connections vibrating loose from clothes dryers, furnaces, or water heaters.
 - Obstructions in or unconventional vent pipe designs which can amplify the above situations.
2. Extended operation of unvented fuel burning devices (range, oven, fireplace).
3. Temperature inversions, which can trap exhaust close to the ground.
4. Car idling in an open or closed attached garage, or near a home.

These conditions are dangerous because they can trap exhaust in your home. Since these conditions can come and go, they are also hard to recreate during a CO investigation.



FIRST ALERT SMOKE/CO DETECTOR

OPTIONAL LOCKING FEATURES

The optional locking features are designed to discourage unauthorized removal of the batteries or Alarm. It is not necessary to activate the locks in single-family households where unauthorized battery or Alarm removal is not a concern.

This Smoke/CO Alarm has two separate locking features: one to lock the battery compartment, and the other to lock the Smoke/CO Alarm to the mounting bracket. You can choose to use either feature independently, or use them both.

Tools you will need: Needle-nose pliers - Standard flathead screwdriver

Both locking features use locking pins, which are molded into the mounting bracket. Depending on which locking features you use, remove one or both pins from the mounting bracket using needle-nose pliers.

IMPORTANT!

To permanently remove either locking pin, insert a flathead screwdriver between the locking pin and the lock and pry the pin out of the lock.

TO LOCK THE BATTERY COMPARTMENT

Do not lock the battery compartment until you install the batteries and test the Smoke/CO Alarm.

1. Install the batteries before attaching the Alarm to the bracket. Insert two (2) AA batteries (included) into the battery compartment. Match the terminals on the end of the battery with the terminals on the unit. Match "+" to "+" and "-" to "-". If the batteries are not fully inserted, the unit cannot receive battery power.
2. Push and hold Test/Silence button until the alarm sounds.

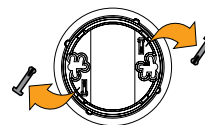
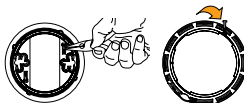
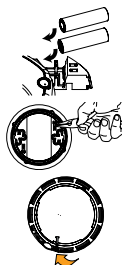
IMPORTANT!

If the unit does not alarm during testing, DO NOT lock the battery compartment! Install new batteries and test again. If the unit still does not alarm, replace it immediately.

3. Using needle-nose pliers, detach one locking pin from the mounting bracket.
4. Push the locking pin through the hole near the battery door latch on the back of the Smoke/CO Alarm.

TO LOCK THE MOUNTING BRACKET

1. Using needle-nose pliers, detach one locking pin from the mounting bracket.
2. Insert the locking pin through the hole on the back of the Smoke/CO Alarm as shown in the diagram.
3. When you attach the Smoke/CO Alarm to the mounting bracket, the locking pin's head will fit into a notch on the bracket.

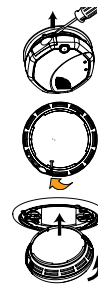


TO UNLOCK THE BATTERY COMPARTMENT

1. Remove the Smoke/CO Alarm from the mounting bracket. If the unit is locked to the bracket, see the section "To Unlock the Mounting Bracket."
2. Insert a flathead screwdriver under the head of the locking pin, and gently pry it out of the battery compartment lock. (If you plan to relock the battery compartment, save the locking pin.)
3. To relock the battery compartment, close the battery door and reinsert locking pin in lock.
4. Reattach the Smoke/CO Alarm to the mounting bracket.

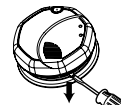
IMPORTANT!

When replacing the batteries, always test the Smoke/CO Alarm before relocking the battery compartment.



TO UNLOCK THE MOUNTING BRACKET

1. Insert a flathead screwdriver into the rectangular cut-out on the mounting bracket nearest to the locking pin.
2. Pry the Smoke/CO Alarm away from the bracket by pushing up on the screwdriver and turning the Smoke/CO Alarm counterclockwise (left) at the same time.



HOW CAN I PROTECT MY FAMILY FROM CO POISONING?

A CO Alarm Is an excellent means of protection. It monitors the air and sounds a loud alarm before Carbon Monoxide levels become threatening for average, healthy adults. A CO Alarm Is not a substitute for proper maintenance of home appliances.

To help prevent CO problems and reduce the risk of CO poisoning:

- Clean chimneys and flues yearly. Keep them free of debris, leaves, and nests for proper air flow. Also, have a professional check for rust and corrosion, cracks, or separations. These conditions can prevent proper air movement and cause backdrafting. Never "cap" or cover a chimney in any way that would block air flow.
- Test and maintain all fuel-burning equipment annually. Many local gas or oil companies and HVAC companies offer appliance inspections for a nominal fee.
- Make regular visual inspections of all fuel-burning appliances. Check appliances for excessive rust and scaling. Also check the flame on the burner and pilot lights. The flame should be blue. A yellow flame means fuel is not being burned completely and CO may be present. Keep the blower door on the furnace closed. Use vents or fans when they are available on all fuel-burning appliances. Make sure appliances are vented to the outside. Do not grill or barbecue indoors, or in garages or on screen porches.
- Check for exhaust backflow from CO sources. Check the draft hood on an operating furnace for a backdraft. Look for cracks on furnace heat exchangers.
- Check the house or garage on the other side of shared wall.
- Keep windows and doors open slightly. If you suspect that CO is escaping into your home, open a window or a door. Opening windows and doors can significantly decrease CO levels.

In addition, familiarize yourself with all enclosed materials. Read this manual in its entirety, and make sure you understand what to do if your CO Alarm sounds.

REGULATORY INFORMATION FOR SMOKE/CO ALARMS

REGULATORY INFORMATION FOR CO ALARMS

WHAT LEVELS OF CO CAUSE AN ALARM?

Canadian Standard 6.19 requires residential CO Alarms to sound when exposed to levels of CO and exposure times as described below. They are measured in parts per million (ppm) of CO over time (in minutes).

CSA 6.19 Required Alarm Points*:

- If the alarm is exposed to 400 ppm of CO, it must alarm between 4 and 15 minutes
- If the alarm is exposed to 150 ppm of CO, it must alarm between 10 and 50 minutes.
- If the alarm is exposed to 70 ppm of CO, it must alarm between 60 and 240 minutes.

* Approximately 10% COHb exposure at levels of 10% to 95% Relative Humidity (RH).

The unit is designed not to alarm when exposed to a constant level of 30 ppm for 30 days.

IMPORTANT!

CO Alarms are designed to alarm before there is an immediate life threat. Since you cannot see or smell CO, never assume it's not present.

This is only possible if Alarms are located, installed, and maintained as described in this manual.

Gas Detection at Typical Temperature and Humidity Ranges: The CO Alarm is not formulated to detect CO levels below 30 ppm typically. Tested for false alarm resistance to Methane (500 ppm), Butane (300 ppm), Heptane (500 ppm), Ethyl Acetate (200 ppm), Isopropyl Alcohol (200 ppm) and Carbon Dioxide (5000 ppm). Values measure gas and vapor concentrations in parts per million.

Audible Alarm: 85 dB minimum at 3 meters (10 feet).

RECOMMENDED LOCATIONS FOR SMOKE ALARMS

Installing Smoke Alarms in Single-Family Residences

The National Fire Protection Association (NFPA), recommends one Smoke Alarm on every floor, in every sleeping area, and in every bedroom. In new construction, the Smoke Alarms must be AC powered and interconnected. See "Agency Placement Recommendations" for details. For additional coverage, it is recommended that you install a Smoke Alarm in all rooms, halls, storage areas, finished attics, and basements, where temperatures normally remain between 40° F (4.4° C) and 100° F (37.8° C). Make sure no door or other obstruction could keep smoke from reaching the Smoke Alarms.

More specifically, install Smoke Alarms:

- On every level of your home, including finished attics and basements.
- Inside every bedroom, especially if people sleep with doors closed.
- In the hall near ever sleeping area. If your home has multiple sleeping areas, install a unit in each. If a hall is over 40 feet (12 meters) long, install an alarm at each end.
- At the top of the first-to-second floor stairway, and at the bottom of basement stairway.

IMPORTANT!

Specific requirements for Smoke Alarm installation vary from state to state and from region to region. Check with your local Fire Department for current requirements in your area. It is recommended AC or AC/DC units be interconnected for added protection.

RECOMMENDED PLACEMENT:



Smoke Alarm
One on every level and in every bedroom



Carbon Monoxide Alarm
One on every level and in every bedroom



Fire Extinguisher
One on every level, plus kitchen and garage



AGENCY PLACEMENT RECOMMENDATIONS

NFPA 72 CHAPTER 29

"For your information, the National Fire Alarm and Signaling Code. NFPA 72, reads as follows:"

29.5.1* Required Detection.

29.5.1.1* Where required by other governing laws, codes, or standards for a specific type of occupancy, approved single and multiple-station smoke alarms shall be installed as follows:

- (1) * in all sleeping rooms and guest rooms
- (2) * Outside of each separate dwelling unit sleeping area, within 21 ft (6.4 m) of any door to a sleeping room, with the distance measured along a path of travel
- (3) On every level of a dwelling unit, including basements
- (4) On every level of a residential board and care occupancy (small facility), including basements and excluding crawl spaces and unfinished attics
- (5) * In the living area(s) of a guest suite
- (6) In the living area(s) of a residential board and care occupancy (small facility)



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Alarms in the living rooms, dining rooms, bedrooms, kitchens, hallways, finished attics, furnace rooms, closets, utility and storage rooms, basements, and attached garages.

ABOUT SMOKE ALARMS

Battery (DC) operated Smoke Alarms: Provide protection even when electricity fails, provided the batteries are fresh and correctly installed. Units are easy to install, and do not require professional installation.

AC powered Smoke Alarms: Can be interconnected so if one unit senses smoke, all units alarm. They do not operate if electricity fails.

AC with battery (DC) back-up: will operate if electricity fails, provided the batteries are fresh and correctly installed. AC and AC/DC units must be installed by a qualified electrician.

Smoke/CO Alarms for Solar or Wind Energy users and battery backup power systems: AC powered Smoke/CO Alarms should only be operated with true or pure sine wave inverters. Operating this Alarm with most battery powered UPS (uninterruptible power supply) products or square wave or "quasi sine wave" inverters will damage the Alarm. If you are not sure about your inverter or UPS type, please consult with the manufacturer to verify.

ABOUT SMOKE ALARMS (CONTINUED)...

Smoke Alarms for the hearing impaired: Special purpose Smoke Alarms should be installed for the hearing impaired. They include a visual alarm and an audible alarm horn, and meet the requirements of the Americans With Disabilities Act. Can be interconnected so if one unit senses smoke, all units alarm.

Smoke Alarms are not to be used with detector guards unless the combination has been evaluated and found suitable for that purpose.

All these Smoke Alarms are designed to provide early warning of fires if located, installed and cared for as described in the user's manual, and if smoke reaches the Alarm.

SPECIAL COMPLIANCE CONSIDERATIONS

⚠WARNING!

This unit alone is not a suitable substitute for complete fire detection systems in places housing many people-like apartment buildings, condominiums, hotels, motels, dormitories, hospitals, long-term health care facilities, nursing homes, day care facilities, or group homes of any kind-even if they were once single-family homes. It is not a suitable substitute for complete fire detection systems in warehouses, industrial facilities, commercial buildings, and special-purpose non-residential buildings which require special fire detection and alarm systems. Depending on the building codes in your area, this unit may be used to provide additional protection in these facilities.

In new construction, most building codes require the use AC or AC/DC powered Smoke Alarms only. AC, AC/DC, or DC powered Smoke Alarms can be used in existing construction as specified by local building codes.

In Canada, refer to the Canadian National Building Code of Canada, the National Fire Code of Canada, CAN/ULC S553 and local requirements.

GENERAL LIMITATIONS OF SMOKE/CO ALARMS

Smoke/CO Alarms may not waken all individuals. Practice the escape plan at least twice a year, making sure that everyone is involved - from kids to grandparents. Allow children to master fire escape planning and practice before holding a fire drill at night when they are sleeping. If children or others do not readily waken to the sound of the Smoke/CO Alarm, or if there are infants or family members with mobility limitations, make sure that someone is assigned to assist them in fire drill and in the event of an emergency. It is recommended that you hold a fire drill while family members are sleeping in order to determine their response to the sound of the Smoke/CO Alarm while sleeping and to determine whether they may need assistance in the event of an emergency.

Smoke/CO Alarms cannot work without power. Battery operated units cannot work if the batteries are missing, disconnected or dead, if the wrong type of batteries are used, or if the batteries are not installed correctly. AC units cannot work if the AC power is cut off for any reason (open fuse or circuit breaker, failure along a power line or at a power station, electrical fire that burns the electrical wires, etc.). If you are concerned about the limitations of battery or AC power, install both types of units.

This Smoke/CO Alarm will not sense smoke or CO that does not reach the sensors. It will only sense smoke or CO at the sensor. Smoke or CO may be present in other areas. Doors or other obstructions may affect the rate at which CO or smoke reaches the sensors. If bedroom doors are usually closed at night, we recommend you install an alarm device (Combination CO and Smoke Alarm, or separate CO Alarms and Smoke Alarms) in each bedroom and in the hallway between them.

This Smoke/CO Alarm may not sense smoke or CO on another level of the home. Example: This alarm device, installed on the second floor, may not sense smoke or CO in the basement. For this reason, one alarm device may not give adequate early warning. Recommended minimum protection is one alarm device in every sleeping area, every bedroom, and on every level of your home. Some experts recommend battery powered Smoke and CO Alarms be used in conjunction with interconnected AC powered Smoke Alarms. For details, see "About Smoke Alarms" for details.

Smoke/CO Alarms may not be heard. The alarm horn loudness meets or exceeds current standards of 85 dB at 3 meters (10 feet). However, if the Smoke/CO Alarm is installed outside the bedroom, it may not wake up a sound sleeper or one who has recently used drugs or has been drinking alcoholic beverages. This is especially true if the door is closed or only partly open. Even persons who are awake may not hear the alarm horn if the sound is blocked by distance or closed doors. Noise from traffic, stereo, radio, television, air conditioner, or other appliances may also prevent alert persons from hearing the alarm horn. This Smoke/CO Alarm is not intended for people who are hearing impaired.

The Alarm may not have time to alarm before the fire itself causes damage, injury, or death, since smoke from some fires may not reach the unit immediately. Examples of this include persons smoking in bed, children playing with matches, or fires caused by violent explosions resulting from escaping gas.

This Smoke/CO Alarm is not a substitute for life insurance. Though this Smoke/CO Alarm warns against increasing CO levels or the presence of smoke, BRK Brands, Inc. does not warrant or imply in any way that they will protect lives. Homeowners and renters must still insure their lives.

This Smoke/CO Alarm has a limited life. Although this Smoke/CO Alarm and all of its parts have passed many stringent tests and are designed to be as reliable as possible, any of these parts could fail at any time. Therefore, you must test this device weekly. Any Smoke/CO Alarm that is beyond the replacement date should be replaced immediately.

This Smoke/CO Alarm is not foolproof. Like all other electronic devices, this Smoke/CO Alarm has limitations. It can only detect smoke or CO that reaches the sensors. It may not give early warning of the source of smoke or CO is in a remote part of the home, away from the alarm device.

Constant exposure to high or low humidity may reduce battery life.



TROUBLESHOOTING GUIDE		
IF THE ALARM...	PROBLEM...	YOU SHOULD...
Horn "chirps" about once per minute.	Low battery warning.	Install two new AA batteries*.
Horn does three rapid "chirps" every minute	Device is not working properly, and needs to be replaced.	Units under warranty should be returned to manufacturer for replacement. See "Limited Warranty" for details.
Carbon Monoxide Alarm Only:		
CO Alarm goes back into alarm 4 minutes after you Silence it.	CO levels indicate a potentially dangerous situations.	IF YOU ARE FEELING SYMPTOMS OF CO POISONING, EVACUATE your home and call 911 or the Fire Department. Refer to "If The CO Alarm Sounds" for details.
CO Alarm sounds frequently even though no high levels of CO are revealed in an investigation.	The CO Alarm may be improperly located. Refer to "Where to Install This Alarm" for details.	Relocate your Alarm. If frequent alarms continue, have home rechecked for potential CO problems. You may be experiencing an intermittent CO problem.
Smoke Alarm Only:		
Smoke Alarm sounds when no smoke is visible.	Unwanted alarm may be caused by non-emergence source like cooking smoke.	Silence Alarm using manual button; clean the alarm's cover with a soft, clean cloth. If frequent unwanted alarms continue, relocate your Alarm. Alarm may be too close to a kitchen, cooking appliance, or steamy bathroom.
*For a list of acceptable replacement batteries, see "Regular Maintenance."		
If you have any questions that cannot be answered by reading this manual, call Customer Service Team: 1-800-323-9005.		



LIMITED WARRANTY

BRK Brands, Inc., ("BRK") the maker of First Alert® brand and BRK® brand products, warrants that for a period of ten years from the date of purchase, this product will be free from defects in material and workmanship. BRK, at its option, will repair or replace this product or any component of the product found to be defective during the warranty period. Replacement will be made with a new or remanufactured product or component. If the product is no longer available, replacement may be made with a similar product of equal or greater value. This is your exclusive warranty.

This warranty is valid for the original retail purchaser from the date of initial retail purchase and is not transferable. Keep the original sales receipt. Proof of purchase is required to obtain warranty performance. BRK dealers, service centers, or retail stores selling BRK products do not have the right to alter, modify or any way change the terms and conditions of this warranty.

This warranty does not cover normal wear of parts or damage resulting from any of the following: negligent use or misuse of the product, use on improper voltage or current, use contrary to the operating instructions, disassembly, repair or alteration by anyone other than BRK or an authorized service center. Further, the warranty does not cover Acts of God, such as fire, flood, hurricanes and tornadoes or any batteries that are included with this unit.

BRK shall not be liable for any incidental or consequential damages caused by the breach of any express or implied warranty. Except to the extent prohibited by applicable law, any implied warranty of merchantability or fitness for a particular purpose is limited in duration to the duration of the above warranty. Some states, provinces or jurisdictions do not allow the exclusion or limitation of incidental or consequential damages or limitations on how long an implied warranty lasts, so the above limitations or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that vary from state to state or province to province.

How to Obtain Warranty Service

Service: If service is required, do not return the product to your retailer. In order to obtain warranty service, contact the Customer Service Team at 1-800-323-9005. To assist us in serving you, please have the model number and date of purchase available when calling.

For Warranty Service return to: 1301 Joe Battle, El Paso, TX 79936

Battery: BRK Brands, Inc. make no warranty, express or implied, written or oral, including that of merchantability or fitness for any particular purpose with respect to battery.

Visit www.firstalert.ca for more information.

For your records, please record:

Date Purchased: _____

Where Purchased: _____

Replace Alarm 84 months after installation.

Note: End of Life Signal – Once the unit reaches the end of its lifecycle, the malfunction signal will sounds once a minute to indicate the need to immediately replace the Alarm.

The End-of-Life Signal can be silenced for up to 2 days.

Do not unplug the alarm or remove the batteries until you get replacement.

The replacement date is the date beyond which the device may no longer detect carbon monoxide and should be immediately replaced.



FURRION

Entertainment System DV1230
Système de divertissement DV1230
Sistema de entretenimiento DV1230

Instruction Manual
Manuel d'instructions
Manual de instrucciones



Product picture is for reference only.
La photo du produit est aux fins de référence seulement.
La imagen del producto es solo de referencia.

Model/Modèle/Modelo:
DV1230



Welcome

English

Thank you and congratulations for purchasing the Furrion® DV1230 Entertainment System. Before operating your new product, please read these instructions carefully. This instruction manual contains information for safe use, installation and maintenance of the product. Please keep this instruction manual in a safe place for future reference. This will ensure safe use and reduce the risk of injury. Be sure to pass on this manual to new owners of this product.

The manufacturer does not accept responsibility for any damages due to not observing these instructions.

If you have any further questions regarding our products, please contact us at **support@furrion.com**



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Safety and Notice


English

Safety



CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN





WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



WARNING

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

 The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock.

 The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.


Class 1 Laser Product

Laser product symbol:
Located on the rear panel of the unit, this symbol indicates this unit is a class 1 laser product that only uses weak laser and produces no hazardous radiation outside of the unit.



1. Read through this instruction manual before installation and use.
2. Do not touch the power plug with wet hands.

3. Switch off the power when the unit is not in use. (Disconnect the power plug from the power outlet when you do not intend to use the unit for a prolonged period of time.) Before moving the unit, remove the disc from the unit/tray first.
4. Do not open the cover or touch any of the components inside of the unit. Only a qualified technician should service the unit.
5. To avoid damaging the unit, do not expose the unit to direct sunlight or objects that radiate heat.
6. Do not place the unit in moist or humid conditions. Moisture will affect normal operation and damage the unit.
7. Place the unit on a flat, well-ventilated location. Please ensure the ventilation holes are not covered to avoid overheating and malfunction.
8. Clean the panel and case with a soft dry cloth only. Do not apply any kind of thinner, alcohol or sprays.
9. The apparatus should not be exposed to dripping or splashing. Do not place objects filled with liquids (such as vases) on the apparatus.



WARNING

- Do not ingest the battery contained within the remote control supplied with the unit as this battery represents a chemical burn hazard.
- This product contains a coin/button cell battery.
- If the coin/button cell battery is swallowed, it can cause severe internal burns in just 2 hours and can lead to death.
- Keep new and used batteries away from children.
- If the battery compartment does not close securely, stop using the product and keep it away from children.
- If you think batteries might have been swallowed or placed inside any part of the body, seek immediate medical attention.

③

FURRION



Safety and Notice

⚠ CAUTION

- Danger of explosion if battery is incorrectly replaced.
- Replace only with the same or equivalent battery type.
- The battery should not be exposed to excessive heat such as sunshine or fire.

- Relocate the receiving antenna.
- Increase the separation between equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Notice of compliance

The device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

FCC rules

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

All registered and unregistered trademarks are property of their respective owners.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.



Introduction

English

What's in the box

Thanks for purchasing the Furrion DV1230 Entertainment System. This manual will help you set up and begin using your product. Please read this manual thoroughly and keep this manual in a safe place for future reference.

First, check the contents of your box with the parts checklist below:

- Main set
- Remote control
- Harness (200mm)
- Audio RCA adapter cable (1.5m)
- Hang tag
- Printed materials

Precautions

Connect this unit to a 12V DC negative ground battery system which is standard in North American and European vehicles.

Ensure when installing the unit, all wire ends which are not being used are terminated with an insulated end to avoid wires shorting or earthing which can lead to the risk of fire or electrical shock.

Avoid inserting foreign objects into the disc loading slot of the unit as this will cause malfunction.

Do not expose this unit to moisture or wet environments. If condensation is present on the screen, wait for 1 hour or more for the moisture to evaporate.

If the interior of the vehicle is extremely hot, do not use the unit until the vehicle's internal temperature has cooled down.

Do not use cleaning products on the front face of the unit. Only use a slightly damp cloth for cleaning.

Do not attempt to disassemble or adjust this unit. Contact a service center for assistance.

Features

- Digital AM / FM Tuner
- DVD/CD-R/RW/MP3/MP4/WMA Compatible
- Bluetooth with NFC function
- Auxiliary inputs on front and rear
- USB input with charging function
- 3 - zone multiroom independent audio output
- 1 x HDMI output with ARC function
- 1 x HDMI input
- 1 x RCA audio/video output for connecting additional TV
- 1 x RCA audio/video input
- 1 x coaxial audio input
- 1 x optical audio input
- 1 x subwoofer output
- 1 x headphone output
- Clock / alarm clock



Introduction

Supported Format

English

Supported Video Format					
File Extension	Container	Video Codec	Audio Codec	Resolution	Remark
.avi .divx	AVI	MPEG-4 Visual DivX 4.xx/5.xx/6.xx/3ivX XviD MPEG-1	Dolby Digital (AC3) WMA/PCM/LPCM AAC-LC (2ch) MPEG-Audio (MP1/MP2/MP3)	720 x 480 (30fps) 720 x 576 (30fps)	
.mpg	MPG	MPEG-1/MPEG-2	Dolby Digital (AC3) LPCM MPEG-Audio (MP1/MP2/MP3)	720 x 480 (30fps) 720 x 576 (30fps)	
.dat	DAT	MPEG-1/MPEG-2	Dolby Digital (AC3) LPCM MPEG-Audio (MP1/MP2/MP3)	720 x 480 (30fps) 720 x 576 (30fps)	
.vob	VOB	MPEG-1/MPEG-2	Dolby Digital (AC3)	720 x 480 (30fps) 720 x 576 (30fps)	
.mp4	MP4	MPEG-4 Visual	Dolby Digital (AC3) WMA/PCM/LPCM AAC-LC (2ch) MPEG-Audio (MP1/MP2/MP3)	720 x 480 (30fps) 720 x 576 (30fps)	
Supported Audio Format					
File Extension	Audio Codec		Bit Rate	Sampling Rate	Remark
.mp3	MP3		16kbps - 320kbps	8k - 48kHz	
.wma	WMA		16kbps - 320kbps	8k - 48kHz	Only WMA7/ WMA8/WMA9 (CBR/VBR) supported (only 353 format supported)

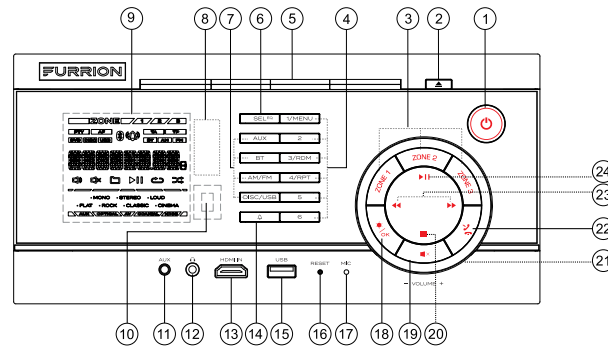
Note: Compatibility with the above file formats is not guaranteed.



Functional Overview

Control Panel

English



- ① Turn on the unit or switch to standby mode.
- ② Eject the loaded disc.
- ③ **ZONE 1/ZONE 2/ ZONE 3**
Turn on or off the audio source in each of the different areas where your speakers are connected.
- ④ **Number buttons (1 - 6)**
Select and enter numbers.
1/MENU: Display the title list during DVD/VCD playback.
3/RDM: Select random playback mode.
4/RPT: Select repeat playback mode.
- ⑤ **Disc slot**
- ⑥ **SEL^{EQ}**
Select various system settings.
Select a preset sound effect.
- ⑦ **Source buttons**
Select the corresponding sound source: DISC/USB, AM/FM, BT, or AUX.
- ⑧ **NFC detection area**
- ⑨ **LCD screen**
- ⑩ **IR sensor for remote control**
- ⑪ **AUX socket**
Connect to the 3.5mm audio output socket on an auxiliary device.
- ⑫ **socket**
Connect a headphone.
- ⑬ **HDMI IN socket**
Connect to the HDMI output socket on an AV device.
- ⑭ Enter alarm setting mode.
- ⑮ **USB socket**
Connect a USB storage device.
- ⑯ **RESET**
Reset the unit and load its factory default settings.
- ⑰ **MIC**
Built-in microphone.
- ⑱ **/ OK**
Adjust brightness of the LCD screen.
Confirm your selection.
- ⑲ Mute or un-mute the audio output.
- ⑳ Stop playback.

⑦

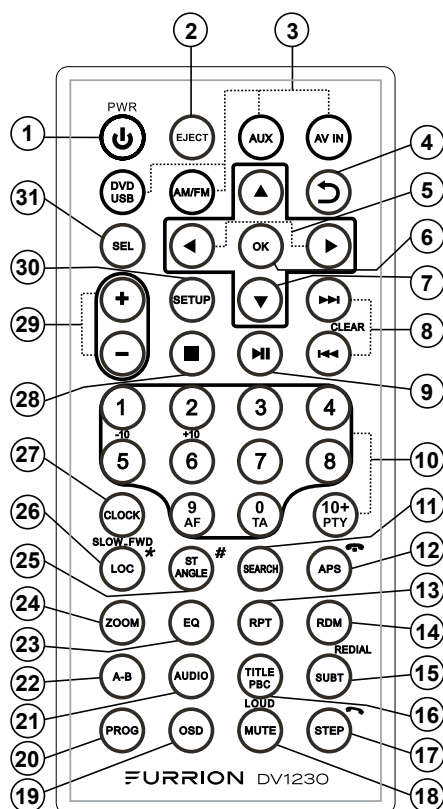
FURRION



Functional Overview

- 21 **VOLUME +/- knob**
Turn the knob clockwise / counterclockwise to increase / decrease volume.
- 22 **✓/☎**
Accept or make a call.
(Press and hold) Reject or end a call.
- 23 **◀◀/▶▶**
Skip to the previous/next track.
Fast backward/forward within a track.
Tune to a radio station.
- 24 **▶▶||**
Start (resume) / pause playback.

Remote Control






- 1 **PWR**
Turn on the unit or switch to standby mode.
- 2 **EJECT**
Eject the loaded disc.
- 3 **Source buttons**
Select the corresponding sound source: DVD/USB, AM/FM, AUX (ARC, F AUX, R AUX, AV, HDMI, COAXIAL, or OPTICAL), or AV IN.
- 4 **◀**
Return to the previous menu.
- 5 **◀/▶**
Navigate left / right in a menu.
- 6 **OK**
Confirm your selection.
- 7 **▲/▼**
Navigate up / down in a menu.
- 8 **◀◀/▶▶ (CLEAR)**
Skip to the previous/next track.
Fast backward / forward within a track.
Tune to a radio station.
▶▶ (CLEAR): Clear a wrong input.
- 9 **▶▶||**
Start (resume) / pause playback.
- 10 **Number buttons (0 - 9) and 10+**
Select and enter numbers.
0/TA: (For Europe only) Enable / disable TA (Traffic Announcement) mode.
5/-10: Skip 10 tracks backward during MP3/WMA playback.
6/+10: Skip 10 tracks forward during MP3/WMA playback.
9/AF: (For Europe only) Enable / disable AF (Alternative Frequency) mode.
10+ / PTY: Input a number larger than 9. (For Europe only) Select a PTY (Program Type).



Functional Overview

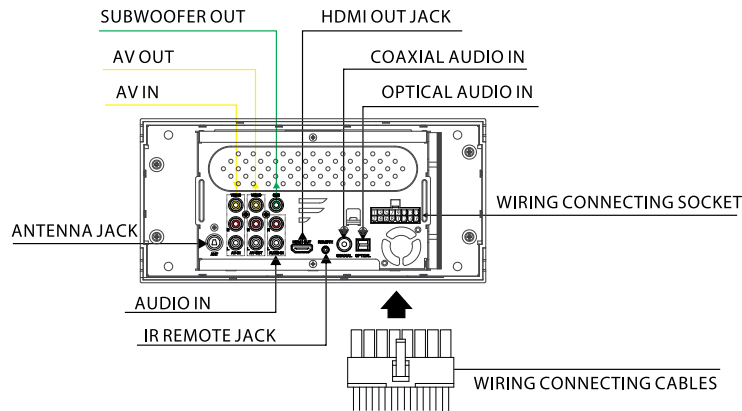
English

- | | |
|--|---|
| <p>⑪ SEARCH
Show or hide the search window during disc playback.</p> <hr/> <p>⑫ APS 
Start automatic programming of radio stations.
Scan preset radio stations.
Reject or end a call.</p> <hr/> <p>⑬ RPT
Select repeat playback mode.</p> <hr/> <p>⑭ RDM
Select random playback mode.</p> <hr/> <p>⑮ SUBT/REDIAL
Select the caption language during DVD playback (if available).
Redial the last dialed number.</p> <hr/> <p>⑯ TITLE/PBC
Display the title list during DVD/VCD playback.
Turn on / off PBC (PlayBack Control) of a disc (if available).</p> <hr/> <p>⑰ STEP 
Play a DVD/VCD frame by frame.
Accept or make a call.</p> <hr/> <p>⑱ MUTE/LOUD
Mute or un-mute the audio output.
Enable or disable the loudness effect.</p> <hr/> <p>⑲ OSD
Display the playback status.</p> <hr/> <p>⑳ PROG
Access or exit program playback.</p> <hr/> <p>㉑ AUDIO
Select a subtitle language (if available) during DVD playback.
Select a sound mode (MONO LEFT, MONO RIGHT, or STEREO) during VCD playback.</p> <hr/> | <p>㉒ A-B
Play a specific segment in a chapter / track repeatedly.</p> <hr/> <p>㉓ EQ
Select a preset EQ sound effect.</p> <hr/> <p>㉔ ZOOM
During DVD/VCD playback, zoom in / out on images.</p> <hr/> <p>㉕ ST/ANGLE/#
In FM mode, switch between stereo and mono sound output.
During DVD playback, adjust the viewing angle (if available).</p> <hr/> <p>㉖ LOC/SLOW.FWD/*
In radio mode, enable or disable local mode.
During disc playback, select a slow forward speed.</p> <hr/> <p>㉗ CLOCK
Enter clock setting mode.
Display the clock.</p> <hr/> <p>㉘ 
Stop playback.</p> <hr/> <p>㉙ +/-
Increase / decrease volume.</p> <hr/> <p>㉚ SETUP
Access or exit the DVD system menu.</p> <hr/> <p>㉛ SEL
Select various system settings.
Select a preset sound effect.</p> <hr/> |
|--|---|



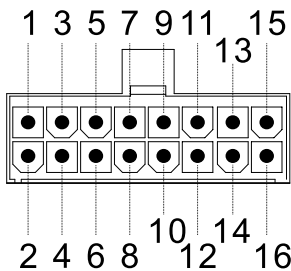
Before Operation

Wiring Diagram



English

View of Wiring Connecting Socket

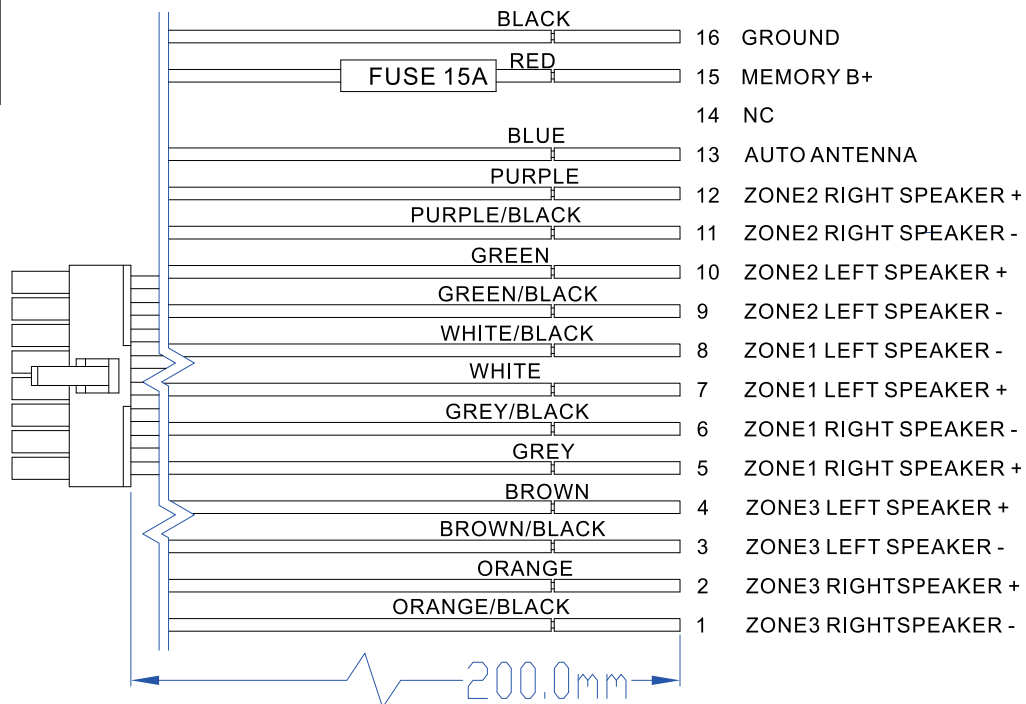


PIN NO	COLOR	FUNCTION
1	ORANGE/BLACK	ZONE3 RIGHT SPEAKER (-)
2	ORANGE	ZONE3 RIGHT SPEAKER (+)
3	BROWN/BLACK	ZONE3 LEFT SPEAKER (-)
4	BROWN	ZONE3 LEFT SPEAKER (+)
5	GREY	ZONE1 RIGHT SPEAKER (+)
6	GREY/BLACK	ZONE1 RIGHT SPEAKER (-)
7	WHITE	ZONE1 LEFT SPEAKER (+)
8	WHITE/BLACK	ZONE1 LEFT SPEAKER (-)
9	GREEN/BLACK	ZONE2 LEFT SPEAKER (-)
10	GREEN	ZONE2 LEFT SPEAKER (+)
11	PURPLE/BLACK	ZONE2 RIGHT SPEAKER (-)
12	PURPLE	ZONE2 RIGHT SPEAKER (+)
13	BLUE	AUTO ANTENNA
14	NONE	
15	RED	POWER+12VDC
16	BLACK	GROUND

Before Operation

Description of Wiring Connecting Cables

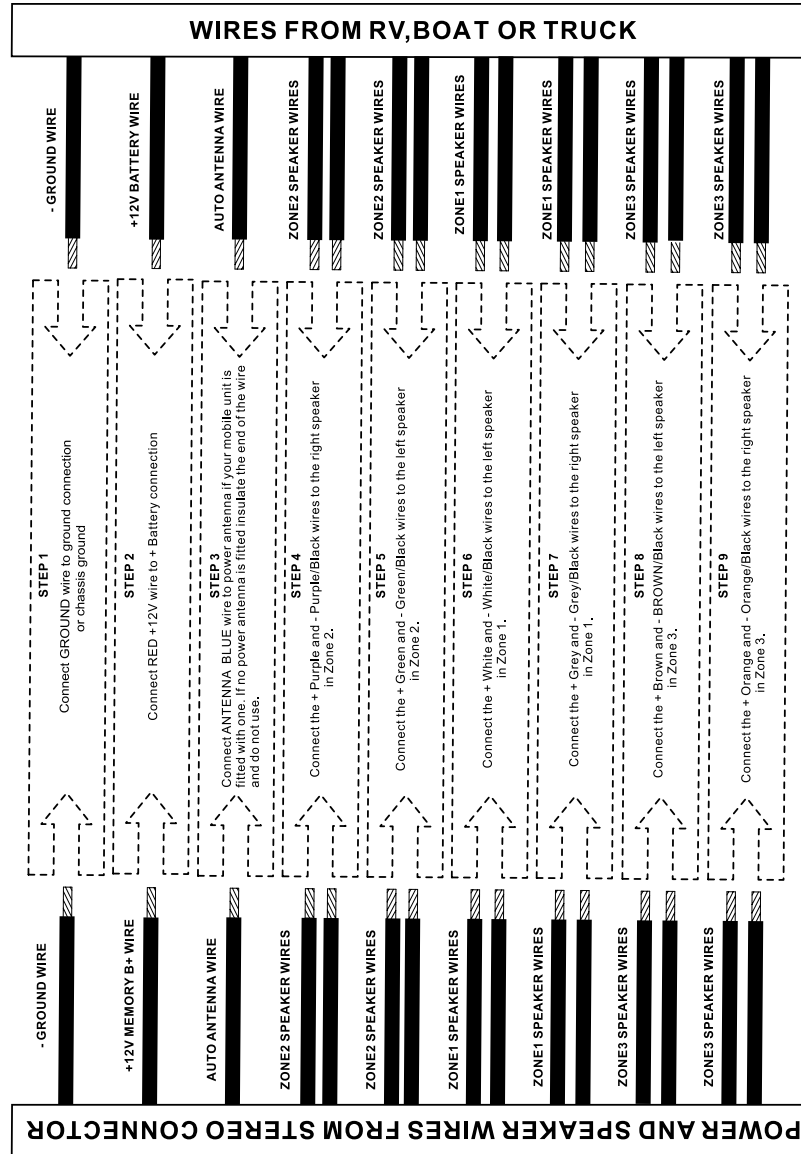
English





Before Operation

English





Before Operation

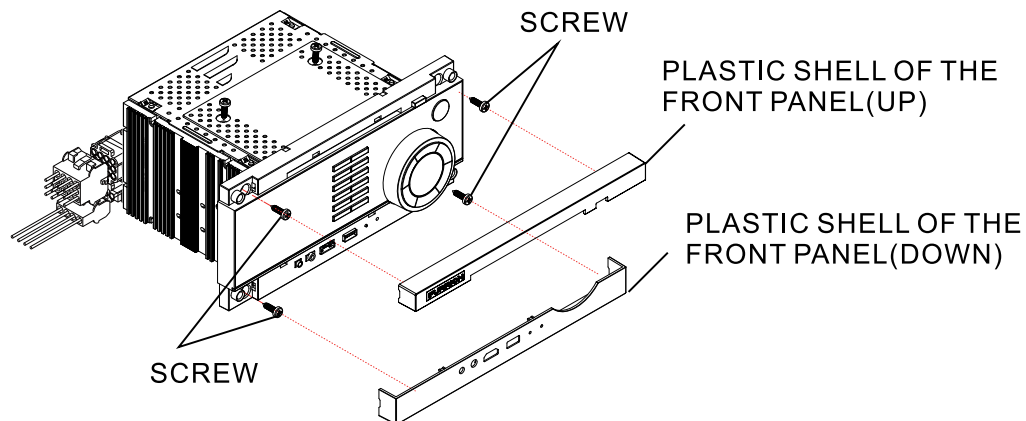
English

Location

1. Choose a mounting location away from humid areas, water sources, appliances or any equipment that can radiate heat.
2. Select an area on a wall or cabinet which is free from cables, fuel or brake lines. Ensure the area behind the unit has a vent hole or if it is an enclosed box, it has adequate room around the rear of the unit for cooling.
3. Ensure when the unit is mounted the wires at the rear are not pressed against the heat sink.

Installing the unit

- Before installing the unit, connect the wiring temporarily and make sure the unit and the system work properly.
 - Fix the unit with screws according to the following diagram.
1. Remove the plastic shell from the front panel on the unit.
 2. Fix the unit with 4 pieces of #8 pan head self tapping screws.
 3. Put back the plastic shell on the front panel of the unit.

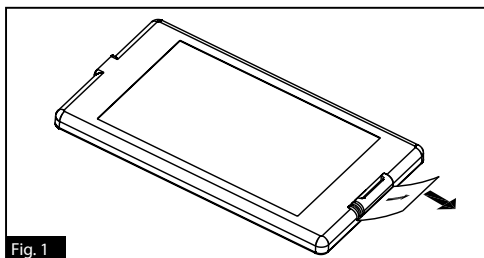




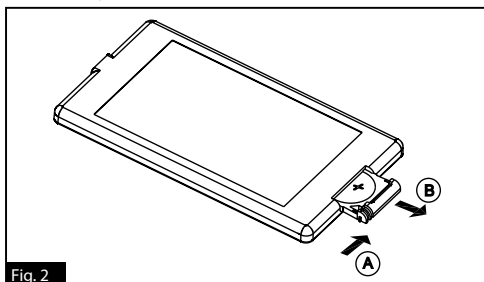
Before Operation

Prepare the Remote Control

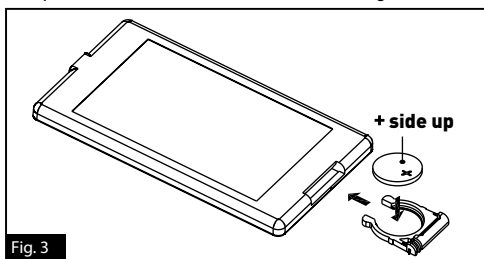
1. Before using the remote control for the first time, pull the insulating sheet out of the remote control in the direction indicated by the arrow. (Fig.1)



2. Press the movable block hold in the direction indicated by arrow A (Fig.2), then pull the battery holder out of the remote control as the direction indicated by arrow B. (Fig.2)



3. Replace the old battery with a new one, with the (+) polarity side upward. (Fig.3)
4. Insert the battery holder into the original position in the remote control. (Fig.3)



Remote control battery note

1. Improper use of a battery may cause overheating or an explosion that could result in injury or fire.
2. Battery leakage may cause damage to the remote control. Battery Life: 6 months with normal use in normal room temperature.
3. Do not short the battery.
4. Do not throw the battery into fire.
5. To avoid the risk of accident, keep the battery out of reach of children.








English



Operation

Quick Reference Guide

English

General Operation	
Power on/off, switch to standby mode	Press  to turn the unit on or enter standby mode. Press and hold  to turn the unit off.
Mute	Press MUTE to mute sound. The  icon flashes on the display. Press MUTE again to restore the sound.
Select a source	Press DISC/USB, AM/FM, AUX, BT to select Disc (with a disc loaded), USB (with a USB storage device connected), AM/FM, AUX, or BT.
Adjust volume	Rotate the VOLUME -/+ knob to adjust volume.
Select a feature / setting	1. Press SEL^{EQ} once or more to select VOL, BAS (without EQ preset), TRE (without EQ preset), BAL, LOUD ON/OFF, LOC ON/OFF, ST ON/OFF, BEEP ON/OFF, SUB ON/OFF, or CLOCK. 2. Rotate the VOLUME -/+ knob to select a feature / setting.
Select a preset EQ	Press and hold SEL^{EQ} once or more to select CINEMA, ROCK CLASSIC, FLAT, or EQ OFF.
Set clock	1. Press SEL^{EQ} on the front panel once or more (or press and hold CLOCK on the remote control) to enter clock setup mode. 2. Rotate the VOLUME -/+ knob to adjust the hour. 3. Press ◀/▶ to enter minute setting. 4. Rotate the VOLUME -/+ knob to adjust the minute. The time on the clock is set automatically after a few seconds of inactivity.
Set alarm	Press and hold  once or more to enter alarm clock and source settings. Repeat the operations in clock setting to set the alarm. Two alarm sources are available for selection: TUNER and USB.
Turn alarm on/off	Press  to turn on or off the set alarm. When the alarm is set, the  icon will stay on the LCD.
Adjust brightness	Press  once or more to select a brightness level for the front panel: LOW, MIDDLE or HIGH.
Select speakers	Press and hold ZONE 1, ZONE 2 or ZONE 3 to select speaker output. The corresponding zone number will be displayed on the LCD once selected.
Reset	Press RESET with a sharp object to reset the unit and load its factory default settings.



Operation

Radio Operation	
Select radio region	Press and hold AM/FM for 2 seconds to set the AM/FM radio region (USA1/USA2/AUSTRALIA/EUROPE).
Manual tuning	Press ◀◀/▶▶ to move the radio frequency down or up one step at a time.
Automatic tuning	Press and hold ◀◀/▶▶ to search for the next strongest station automatically.
Select a band	Press AM/FM once or more to select FM1, FM2, FM3, AM1, or AM2.
Store and recall a preset station	Press and hold any one of the six preset buttons (1-6) to store the current frequency. Press the corresponding preset number button to recall the stored frequency.
Store stations automatically	Press and hold APS on the remote control (or ■ on the front panel) to automatically store the six strongest stations on the current band. Up to 18 FM stations and 12 AM stations can be stored.
Scan preset stations	Press APS on the remote control (or ■ on the front panel) to scan presets 1-6 on the current band.
LOC	Press LOC on the remote control to turn on / off the LOC (local) function.
Stereo/mono	In FM mode, press SEL one or more to select stereo or mono sound output.

English



Operation

English	Disc / USB Operation	
	Insert a disc	With the label facing up, insert a disc into the disc slot. The disc will automatically begin playback.
	Eject the disc	Press EJECT to eject the disc.
	Select a chapter / track	Press ◀◀/▶▶ to skip to the previous or next chapter / track.
	Fast backward / forward	Press and hold ◀◀/▶▶ to fast backward / forward.
	Pause playback	Press ▶ to temporarily stop playback. Press ▶ again to resume playback.
	Stop playback	Press ■ once to pause playback. Then you can press ▶ to resume. Press ■ twice to stop playback. Then press ▶ to start playback from the beginning of the first chapter / track.
	Repeat	Press RPT to select RPT ONE/RPT DIR/RPT ALL/RPT OFF MODE. Press RPT again to resume.
	Random	Press RDM to play each track in random order. Press RDM again to resume.
	Title	In DVD/VCD mode, press TITLE on the remote control to display the title list.


Bluetooth Operation	
Accept or make a call	Press 📞/📞 on the front panel (or 📞 on the remote control) to accept an incoming call, or dial or redial a telephone number.
Reject or end a call	Press and hold 📞/📞 on the front panel (or press 📞 on the remote control) to reject or end a call.



Operation

Common Operation

Turn the unit on or switch to standby mode

Press  to turn the unit on or switch to standby mode.

Select a source

DISC / USB - Once a DVD or USB is inserted into the unit, the unit will automatically switch to the corresponding source. If a disc has already been inserted and the unit is playing from another source, you can press **DVD / USB** to select DVD.

AM/FM - Press this button to scroll through FM1, FM2, FM3, AM1, and AM2. Press and hold this button once or more to select the radio region: USA1, USA2, AUSTRALIA, or EUROPE.

BT - Press this button to enable Bluetooth connection.

AUX - Press this button to scroll through the AUX inputs available for the unit.

F AUX - Connection on the front of the unit to connect an external audio source.

R AUX - Connection on the rear of the unit, normally used to connect TV sound input.

AV - Connection on the rear of the unit to connect an external audio source.

HDMI - Connection on the front of the unit.

COAXIAL - Connection on the rear of the unit.

OPTICAL - Connection on the rear of the unit.

HDMI OUT (ARC) - Connection on the rear of the unit, used to connect a TV with Audio Return Channel function. Make sure the ARC function of the TV is on.

- For details on setting and operating your TV, refer to the instruction manual for the TV.

About Audio Return Channel (ARC)

ARC allows audio signals to travel both ways under HDMI Control. If you connect a TV that supports HDMI Control and ARC to the unit with a single HDMI cable, you can output video/audio to the TV or input TV audio to the unit. In case noises are produced from the speakers connected to the unit because TV audio signals input to the unit via ARC are not supported by the unit, use the TV's speakers.

Adjust volume

Rotate the **VOLUME +/-** knob clockwise to increase volume, or rotate counterclockwise to decrease volume.

Mute

1. Press **MUTE** to mute sound output in any source mode.
'MUTE' will be displayed on the screen.
2. Press **MUTE** again to resume.

Display and set the clock




1. To display the clock on the LCD screen, press **CLOCK** on the remote control. In standby mode, the clock time will stay on the LCD.
2. To adjust or set the clock, press **SEL**^{EQ} on the front panel once or more to enter clock setup mode.
Press **◀◀/▶▶** to switch between hour and minute setting.
Rotate the **VOLUME +/-** knob to adjust the hour / minute.
The time on the clock is set automatically after a few seconds of inactivity.



Operation

English

Set the alarm

1. Press and hold  once or more to enter alarm clock and source settings.
 2. Repeat the operations in clock setting to set the alarm.
Two alarm sources are available for selection: TUNER and USB.
- Press  to turn on or off the set alarm.
When the alarm is set, the  icon will stay on the LCD.


Select a preset EQ mode

Press and hold **SEL**^{EQ} to select the preset music equalizer curves: CINEMA, ROCK, CLASSIC, FLAT, or EQ OFF.

Turn on / off LOUD mode

Press **SEL**^{EQ} on the front panel once or more to turn on / off LOUD mode.

Adjust the sound equalizer curves

1. Press **SEL**^{EQ} on the front panel once or more to select a sound equalizer curve: VOL, BAS (without preset EQ), TRE (without preset EQ), BAL, LOUD ON/OFF, LOC ON/OFF, ST ON/OFF, BEEP ON/OFF, or SUB ON/OFF.
2. Rotate the **VOLUME**  knob on the front panel to select a sound feature.

Select ZONE 1 / ZONE 2 / ZONE 3

Press and hold **ZONE 1 / ZONE 2 / ZONE 3** to turn on or off the audio source in each of the different areas where your speakers are connected.

The corresponding zone number will be displayed on the LCD once selected.

Note: **ZONE 3** supports independent audio output control.

- Press **ZONE 3** to activate independent audio selection mode.
The "ZONE 3" icon will flash on the LCD.
- Select the media source (DISC/USB, AM/FM, BT, F AUX/R AUX, AV, HDMI, COAXIAL, OPTICAL), then adjust the audio effect and preset EQ independently.
- After setting ZONE 3 audio output, you can press **ZONE 3** again to switch back to ZONE1/ZONE 2 audio output control mode (ZONE 1 and ZONE 2 in the same group).
The "ZONE 3" icon will stop flashing.
- If ARC is selected as the media source of ZONE 3 (ZONE 1/ZONE 2), the media source of ZONE 1/ZONE2 (ZONE 3) can be selected as DISC/USB, AM/FM, BT, F AUX, R AUX, AV, or ARC.
- If AM/FM or BT is selected as the media source of ZONE 3 (ZONE 1/ZONE 2), the media source of ZONE 1/ZONE2 (ZONE 3) can be selected as DISC/USB, AM/FM, BT, F AUX, R AUX, AV, HDMI, COAXIAL, OPTICAL, or ARC.
- If USB/DISC is selected as the media source of ZONE 3 (ZONE 1/ZONE 2), the media source of ZONE 1/ZONE2 (ZONE 3) can be selected as AM/FM, BT, F AUX, R AUX, or AV.

Reset the unit

In case of incorrect display, button failure, or distorted sound, you can press **RESET** with a sharp object such as a clip to reset the unit and load its factory default settings.



Operation

Radio Operation

Select a radio region

In radio mode, press and hold **AM/FM** to select your desired radio region: USA1/USA2/AUSTRALIA/EUROPE.

Select AM/FM band

In radio mode, press **AM/FM** once or more to select your desired radio band: FM1, FM2, FM3, AM1, or AM2.

The selected band will be displayed on the front panel.

Tune to / search for radio stations

In radio mode:

- Press and hold **◀◀/▶▶** on the front panel (or **◀◀/▶▶** on the remote control) to automatically search down/up for an available station from the current frequency.
- Press **◀◀/▶▶** on the front panel (or **◀◀/▶▶** on the remote control) to manually search up or down for your desired station from the current frequency.

Use the **■** / **APS** button

In radio mode:

1. Press and hold **■** on the front panel (or **APS** on the remote control) to search for radio frequencies with sufficient signal strength (starting from the lowest frequency and ending until the search cycle is finished).
Then the 6 strongest stations are preset to the memory bank of the corresponding preset number. The AS operation is implemented in each bank of the selected band. When the AS operation is finished, radio broadcast will resume on M1. (A total of 3x6 stations for FM and 2x6 stations for AM can be stored.)

2. Press **■** on the front panel (or **APS** on the remote control) to search for each preset radio station starting from M1. When the field strength level is above the threshold of the stop level, the radio holds at that preset number for a few seconds, and then searches again. The search stops on M1 when the search cycle is finished.

NOTE:

On FM band, FM1, FM2, FM3 is checked once at a time.

On AM band, AM1, AM2 is checked once at a time.

Use the preset number button (1-6)

In radio mode:

1. To store the current frequency on the current band, press and hold any one of the six preset number buttons (1-6).
2. To recall the preset memory on the current band, press one of the preset buttons (1-6).

Switch between STEREO/MONO

Press **SEL^{EQ}** on the front panel (or **ST** on the remote control) once or more to select ST ON or ST OFF mode in FM mode.

Use the LOC ON / OFF function

1. In radio mode, when the signals of the distant radio stations are very weak and the reception is poor during tuning, press **SEL^{EQ}** on the front panel (or **LOC** on the remote control) once or more to select LOC OFF mode, and then tune again for the distant radio stations.
2. In radio mode, too strong signals from the local radio stations may lead to interference. You can press **SEL^{EQ}** on the front panel (or **LOC** on the remote control) once or more to select LOC ON mode, and then re-tune to the local stations if required.




Operation

English

Basic Disc / USB Operation



Start playback

1. Press  to turn on the unit.
2. Turn on the TV set, from which the video output is connected to the video input of the unit. If nothing displays on the TV screen when the unit is turned on, ensure that the TV is set to the right video input (not TV channel). For example, if the TV is connected with the unit via the VIDEO 1 INPUT, then you need to set the TV to VIDEO1.
3. Insert a disc into the disc slot (with the label side facing up).





NOTE:

- Discs that are seriously scratched or of poor manufacturing or recording quality may not play.
- If the unit cannot read a disc in normal conditions, please try to eject and reload the disc.
- In addition to normal CD and DVD, this unit supports CD-R, CD-R/W, DVD-R and DVD-R/W playback as well. However, depending on the conditions of the recording equipment, recording program or the disc itself, some CD-R, CD-R/W, DVD-R or DVD-R/W may not play.
- When dealing with CD-R, CD-R/W, DVD-R or DVD-R/W recording, too high recording speed may result in poor signal quality and therefore, it is recommended to select as low recording speed as possible.





Pause playback





When playing DVD/VCD/CD/MP4/MP3/WMA discs, press  to pause playback. You can press  again to resume normal playback.

Stop playback

- When playing DVD/VCD/MP3/WMA/CD discs, press  once to pause playback, then you can press  to resume normal playback.
- During playback, press  twice to stop playback, then you can press  to start playback from the beginning of the first chapter / track.

Select a chapter/track

Press  /  on the front panel (or  /  on the remote control) during playback to select the previous / next chapter or track for playback.

Note: You can press and hold  /  on the front panel (or  /  on the remote control) to fast backward / forward within a chapter / track.

Select a chapter / track with the number buttons

- When playing DVD/VCD (PBC OFF)/MP3/WMA/CD discs, use number buttons (**0 - 9**) to directly select and play a chapter / track numbered 1 to 9.
- To play a chapter / track with the serial number larger than 9, use the **10+** and **0 - 9** buttons. For example, to play the 13th chapter / track, first press the **10+** button once, then press the **3** button; to play the 34th chapter / track, first press the **10+** button 3 times, then press the **4** button.

Note: You can press and hold the **5/-10** or **6/+10** buttons to skip 10 tracks forward / backward (for MP3/WMA only).



Operation

Select a chapter / track from the root/PBC menu (if available)

For DVD:

1. Press **TITLE** on the remote control to display the title list.
2. Press the navigation buttons to select your desired title, and then press **OK** or **▶||** to open the root menu of the selected title.
3. Press the navigation buttons to select your desired chapter, then press **OK** or **▶||** to play the selected chapter.
- During playback, you can press **1/MENU** on the front panel (or press and hold **TITLE** on the remote control) to display the root menu of the current title directly, and then perform the same operation to resume normal playback.

For VCD:

1. When PBC is enabled, the beginning of the disc will play with the PBC menu (if available) displayed on the TV screen.
2. Press the number buttons to select your desired track to play.

For MP3/WMA:

- During playback, the root menu is displayed on the TV screen all the time (**TITLE/PBC** unavailable).
- Press the navigation buttons to select your desired folder, and then press **OK** or **▶||** to open the folder.
Press the navigation buttons to select your desired file, and then press **OK** to play the selected file.

For CD:

The **TITLE/PBC** button is disabled.

Terminate playback

1. Press **EJECT** to eject the disc.
2. Press and hold **⏻** on the front panel (or press **⏻** on the remote control) to turn off the unit.

Advanced Disc / USB Operation

Fast backward / forward

During normal playback, press and hold **◀◀/▶▶** on the front panel (or **◀◀/▶▶** on the remote control) once or more to fast backward or forward at the following speed: x2, x4, x8, x20, or normal.

During fast backward / forward, press **▶||** to resume normal playback.

Slow forward

- During playback, press **SLOW_FWD** on the remote control to slow forward.
- Press **SLOW_FWD** consecutively to decrease the playback speed as follows: x1/2, x1/3, x1/4, x1/5, x1/6, x1/7, normal.
- During slow forward, press **▶||** to resume normal playback.

Note: The function is only available for video playback.

Play frame by frame

1. During DVD/VCD playback, press **STEP** on the remote control consecutively to play frame by frame forward.
2. Press **▶||** to resume normal playback.

Play repeatedly

Repeat One / All

1. During DVD playback:
Press **RPT** to select REP CHAPTER, REP TITLE, REP ALL, or REP OFF.
2. During VCD (PBC OFF)/CD playback:
Press **RPT** to select REP ONE, REP ALL, or OFF.
The **RPT** button is unavailable when PBC is enabled during VCD playback.
3. During MP3/WMA playback:
Press **RPT** to select REP ONE, REP DIR, REP ALL, or OFF.



Operation

English

Repeat A-B

Use this function if you want to repeat a specific segment on a disc that you define:

1. Press **A-B** at a point (A) where you want it to be the start point of the repeat segment.
2. Press **A-B** again at a point (B) where you want it to be the terminal point of the repeat segment.
Then the segment will be played repeatedly.
- To cancel **A-B** repeat mode and resume normal playback, press **A-B** for the third time.

Note:

During DVD/VCD/MP3/WMA/CD playback, points A and B must be within the same track.

Play from a specified chapter / track or specified time

During DVD playback:

1. Press **SEARCH** on the remote control to display a search box, with the title field highlighted.
2. Use the number buttons to input the serial number of a title.
3. Use the navigation buttons to highlight the chapter field, and then use the number buttons to input the serial number of a chapter.
4. Press **OK** or **▶II** to play the selected chapter.

During VCD/MP3/WMA/CD playback:

1. Press **SEARCH** on the remote control to display a search box, with the track field highlighted.
2. Use the number buttons to input the serial number of a track, and then press **OK** or **▶II** to play the selected track.

Play randomly

During DVD/VCD (PBC OFF)/MP3/WMA/CD playback, press **RDM** once or more to switch between RANDOM ON and RANDOM OFF. In RANDOM ON mode, the chapters / tracks will be played randomly.

Play from different angles

During DVD playback, press **ANGLE** on the remote control once or more to view from different angles.

Note:

- This function is only available for DVD discs recorded with different camera angles.
- The **ANGLE** button is unavailable for VCD/MP3/WMA/CD discs.

Zoom in / out during playback

1. During DVD/VCD playback, press **ZOOM** on the remote control once or more to enlarge a certain area of the images on the screen with these multiples: ZOOMx2, ZOOMx3, ZOOMx4, ZOOMx1/2, ZOOMx1/3, ZOOMx1/4, ZOOM OFF.
2. Press one of the navigation buttons to select the area you want to enlarge.

Change the caption language

When playing DVDs, press **SUBT** on the remote control once or more to select the caption language or turn off the caption (if available).

Note: This function is unavailable for VCD/MP3/WMA/CD discs.

Change the audio language

- When playing DVDs, press **AUDIO** on the remote control once or more to select the desired language type (if available).
- When playing VCD discs, press **AUDIO** on the remote control once or more to select MONO L, MONO R, AUTO L, AUTO R, or Stereo (no language function).
- For CD/WMA/MP3, the **AUDIO** button is invalid.



Operation

Check the playback status

When playing DVD/VCD/CD discs, press **OSD** on the remote control once or more to turn on or off playback status display.

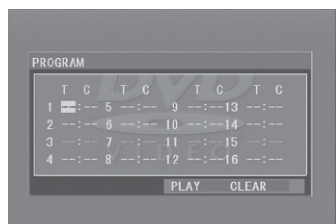
- For DVD discs, this function allows you to check such information as the current title and chapter numbers, and the elapsed and remaining time of both the current title and chapter etc.
- For VCD/CD discs, this function allows you to check such information as the current track number, and the elapsed and remaining time of both the current track and the whole disc.

Program playback

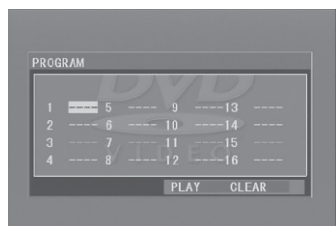
This function allows you to play some titles / chapters / tracks on a DVD/VCD/MP3/WMA/CD disc in your specified order.

1. During playback, press **PROG** on the remote control to enter a program interface as follows:

For DVDs



For VCD/MP3/WMA/CD discs



2. Use the navigation buttons to move the cursor onto the desired place for inputting the sequence number.

3. Use the number buttons to input the title / chapter / track sequence numbers you want in your desired order.
4. Press **▶||** directly, or use the navigation buttons to move the cursor onto **PLAY**, and then press **OK** on the remote control to play the programmed titles / chapters / tracks in the programmed order.
 - To exit program playback, press **■** followed by **▶||**, or press **PROG** twice again.
 - To remove all programmed sequence numbers, move the cursor onto **CLEAR**, and then press **OK** on the remote control.
 - To change the programmed sequence, move the cursor onto the item you want to change, and then input the desired sequence number.
 - During VCD playback with PBC enabled, PBC will be disabled when you enter program playback.

Play a JPEG picture CD

In disc mode, the root menu is displayed on the screen with MP3/WMA files being played at the same time. (**TITLE / PBC** button unavailable).

In the root menu, the left file sort icon is for MP3/WMA files, the middle one is for video files, and the right one is for JPEG files. If one of these 3 sorts of files does not exist, you cannot move the cursor onto the corresponding file sort icon.

1. Press the navigation buttons to select your desired folder, file or file sort icon from the root menu.
2. Press **OK** or **▶||** to open the selected folder, or play the selected file, or play the selected sort of files only.
 - In the root menu, you can also use the number buttons to select a file for playback.



Operation

English

- After selecting the JPEG file sort icon and entering the folder, you can use the navigation buttons to select your desired JPEG file, and then press **OK** or **▶II** to start full-screen playback starting from the selected JPEG picture.
- During JPEG playback, use the navigation buttons to change the angle of the displayed picture as follows:
 - ▶: 90 degrees clockwise
 - ◀: 90 degrees counterclockwise
 - ▲: Up <--> Down
 - ▼: Left <--> Right
- During JPEG playback, press **PROG** on the remote control to change the picture refresh mode.
- During JPEG playback, press **■** to stop playback and return to the root menu.
- During JPEG playback, the following buttons are unavailable: **SLOW-FWD**, **SUBT**, **TITLE/PBC**, **ANGLE**, **STEP**, **AUDIO**, **RDM** and **A-B**.
- In JPEG mode, the other operations are the same as those in MP3/WMA mode.

Play MP4

In disc mode, the root menu is displayed on the screen and the first file will be played automatically.

During playback, you can press **■** to stop playback and return to the root menu.

1. Press the navigation buttons to select your desired folder or file from the root menu.
 2. Press **OK** or **▶II** to open the folder, or play the selected file.
- In the root menu, you can also use the number buttons to select a file for playback.
 - The **ANGLE**, **PROG**, **RDM**, and **TITLE/PBC** buttons are invalid.
 - The other functions are the same as those in DVD operation, while the repeat function is the same as that in MP3/WMA operation.

ESP and ID3 functions

- The unit supports the ESP (Electrical Shock Protection) function to ensure smooth disc playback on the move.
- During MP3/WMA playback, the current file and folder names as well as the ID3 information (if available in V1.0/2.0 format) will scroll on the LCD screen. The ID3 information includes the song title, and the artist and album name.

USB operation

Power on the unit, then connect a USB storage device to the **USB** socket.

The screen will display the root menu of the USB storage device.

This unit supports picture (JPEG format), audio (MP3 or WMA format) and video (MP4 format) playback. All the operations are the same as those of the corresponding format.

NOTE:

1. Compatibility with all file formats is not guaranteed.
2. Not all USB products can be charged from the unit.

Set up the DVD System Menu

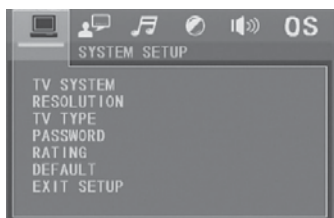
1. Press **SETUP** on the remote control to access the DVD System Menu on the TV screen. There are 6 setup pages in total.
 2. Press **◀/▶** to select a desired setup page.
 3. Press **▲/▼** to select a setup item on the selected setup page.
 4. Press **▶** to enter the setup item.
 5. Press **▲/▼** to select an option for the setup item, and then press **OK** to confirm.
- Press **◀** to return to the upper level.
 - Press **SETUP** on the remote control again or use the navigation buttons to highlight **EXIT SETUP** and then press **OK** to exit the System Menu.



Operation

The 6 setup pages of the DVD System Menu are as follows:

SYSTEM SETUP



TV SYSTEM

The unit supports output of various TV systems.

If your TV only supports NTSC or PAL system, the screen will blink and become colorless when the wrong TV system is selected. In this case go to **TV SYSTEM** and select NTSC, PAL or AUTO to match the system of your TV.

RESOLUTION

Select the resolution level.

TV TYPE

Select an option below to match your TV screen size.

4:3 PS: Choose the item when connecting a TV set with 4:3 screen. When playing pictures of 16:9 size, the left and right parts of the video will be cut out, and displayed on full screen.

4:3 LB: Choose the item when connecting a TV set with 4:3 screen. When playing pictures of 16:9 size, the top and bottom parts of the TV screen will be turned into a black square respectively.

16:9: Choose the item when connecting a TV set with 16:9 wide screen.

PASSWORD

Lock or unlock the rating level of Parental Control.

The default state is locked, and the default password is 0000.

You can set a new password that you like: Select **PASSWORD** and then press ► to enter the setup item.

Input the original password 0000, and then press **OK** to unlock it.

Press ► to enter the setup item again, then input a new password that you like and finally press **OK** to confirm.

RATING

Set a new rating level for Parental Control.

- Select **PASSWORD** and then press ► to enter the setup item.

Input the set password, and then press **OK** to unlock the rating level setting for Parental Control.

- Select **RATING** and then press ► to enter the setup item.

Use the navigation buttons to select your desired rating level, and then press **OK** to confirm.

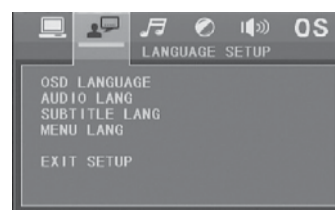
- Select **PASSWORD** again and then press ► to enter the setup item.

Input the password and then press **OK** to lock the new rating level setting for Parental Control.

DEFAULT

Reset all settings to their original status.

LANGUAGE SETUP



OSD LANGUAGE

Select the language of the system menu and all interfaces displayed during playback.

AUDIO LANG

Select the audio language.

SUBTITLE LANG

Select the subtitle language.



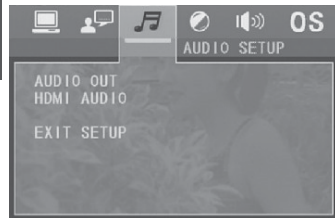
Operation

English

MENU LANG

Select the disc menu language.

AUDIO SETUP



AUDIO OUT

Select a digital output method: **SPDIF/OFF**, **SPDIF /RAW**, or **SPDIF/PCM**.

HDMI AUDIO:

AUTO: Selected to output the audio automatically by RAW or PCM type.

VIDEO SETUP



BRIGHTNESS

Adjust the brightness of video output.

CONTRAST

Adjust the contrast of video output.

HUE

Adjust the hue of video output.

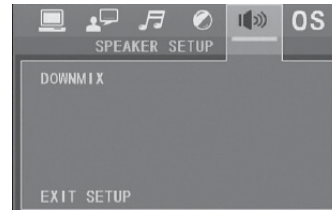
SATURATION

Adjust the saturation of video output.

SHARPNESS

Adjust the sharpness of video output.

SPEAKER SETUP



DOWNMIX

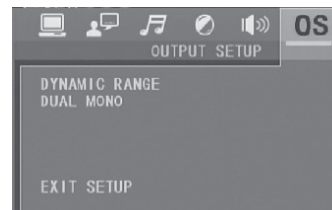
Select your desired sound effect when there is no center speaker or subwoofer.

LT/RT: When playing a disc with PRO LOGIC Dolby stereo effect, choose the item to output audio signal with vivid theatre effect.

STEREO: If you choose this item, for audio signal with 5.1 channels, only signal of the left and right channels will be output; for audio signal with 2 channels, the common stereo signal will be output.

VSS: If you choose this item, for a disc recorded with 5.1 channels, the main channel speakers can output audio signal with VSS effect.

DIGITAL SETUP



DYNAMIC RANGE

After selecting the compression mode of **LINE OUT**, you can set this item to adjust the linear compression ratio.

FULL: Set the Peak-to-Peak value of the audio signal to minimum.

OFF: Set the Peak-to-Peak value to maximum.



Operation

DUAL MONO

Select a desired audio output mode for the left and right channels of signal.

It is mainly for Karaoke of Ac3.

There are 4 modes in all:

STEREO, MONO L, MONO R, MIX MONO

About Parental Control

- Q:** After insertion of a DVD into the disc slot, a dialogue box appears, asking for a password of 4 digits. Why?
- A:** This is because the movie you are playing was rated with Parental Control, and the current rating level of the unit is lower than the one of the current disc. You must input the right password and enter it into the Parental Control setup menu and then set an equal or higher rating level than the one of the current disc.

Note:

- If you have not changed the password, the factory preset password for the unit will be empty. You will need to input a desired password and verify it by inputting the password again before entering the Parental Control setup menu.
- For the rating level setup of Parental Control of the unit, please refer to the relative content of the SYSTEM SETUP menu for details.

Accessories: Parental Control

The Parental Control function of a DVD player can be used to control playback of movie scenes on a DVD disc set with a rating level.

You can set the DVD player (including the software player on a PC) with a certain rating level via the SETUP MENU on the TV screen.

If the rating level set in the disc is higher than the one set in the DVD player, the DVD player cannot play the disc. Sometimes the Parental Control sequences in some discs are different from each other. The rating level setup can be protected with a password. If you select **Unlock**, the Parental Control function will be invalid, and the whole content of the disc can be played.

A DVD disc can be designed with different rating levels of Parental Control so that the DVD player can play different versions of scenes from the same movie based on the set rating levels. Depending on the DVD feature of seamless switching, the scenes unsuitable for children will be cleared or replaced by other suitable scenes automatically.

All rating levels of Parental Control are as follows:

- Unlock
1. Kid Safe
 2. G
 3. PG
 4. PG 13
 5. R
 6. NC 17
 7. Adult



Operation

English

Region Code

Q: No DVD playback. REGION ERROR is displayed after insertion of a disc into the disc slot. Why?

A: Because the DVD player and disc have different region codes. If they do not match, the DVD player cannot play the disc.

Appendix: Region code of DVD

The Motion Picture Association of America (MPAA) divided the world into 6 regions, and allocated every region a code, named the region code. The region codes and the countries or areas represented by the region codes are as follows:

Region 1: America, Canada, East-Pacific Islands;

Region 2: Japan, West Europe, North Europe, Egypt, South Africa, Middle East;

Region 3: South-east Asian countries including Taiwan, Hong Kong, South Korea, Thailand, Indonesia, etc.;

Region 4: Australia, New Zealand, Central South America, South Pacific Islands;

Region 5: Russia, Mongolia, Indian Peninsula, Middle Asia, East Europe, North Korea, North Africa, North-west Asia etc.;

Region 6: China mainland.



Operation

Bluetooth Operation

Pair DV1230 with your mobile phone

1. Activate Bluetooth mode on your mobile device. Then press **BT** on the front panel of DV1230 to enter pairing mode.
2. When DV1230 is detected by your mobile phone, the device name **FURRION DV1230-XXXX** (where **X** can be any character from A-Z or number from 0-9) is shown on your mobile phone.
3. Select the device name on your mobile phone, then an input box will pop up, asking you to input a password.
4. Input 0000 and confirm. Upon successful pairing and connection, 'LINK OK' will appear on the LCD of DV1230.

Note:

1. Some mobile phones support automatic re-connection after first-time pairing with DV1230. Some other mobile phones may need you to select the device name (**FURRION DV1230-XXXX**) from the list of paired Bluetooth devices to confirm re-connection.
2. In case of casual disconnection, select the device name (**FURRION DV1230-XXXX**) from the list of paired Bluetooth devices to confirm re-connection.

Disconnect / unpair DV1230 from your mobile phone

1. To disconnect:
On your mobile phone, select the connected device name (**FURRION DV1230-XXXX**) from the list of paired Bluetooth devices and confirm disconnection.
2. To unpair:
Press and hold **BT** on the front panel of DV1230 for about 5 seconds to clear the pairing information.

Operate your mobile phone via Bluetooth

When the Bluetooth connection is ready, the call you make or receive will be transferred from your mobile phone to DV1230.

1. When connected: Use controls on your mobile phone to switch sound output between DV1230 and the mobile phone.
2. To dial a number with the remote control of DV1230:
 - Use number buttons **0-9** to enter a telephone number.
 - * You can press **CLEAR** to cancel a wrong input if necessary.
 - Press / on the front panel (or on the remote control) to call out.
3. To redial a number:
 - Press / on the front panel (or on the remote control) to show the last dialed number on the LCD and call out.
4. To accept a call:
When there is an incoming call, press / on the front panel (or on the remote control) to accept the call.
5. To reject a call:
When there is an incoming call, press and hold / on the front panel (or press on the remote control) to reject the call.
6. To end a call:
During a call, press and hold / on the front panel (or press on the remote control) to end the call.

Note: When there is an incoming call, the calling number will be displayed on the screen of DV1230.



Operation

English

Play an audio file from another Bluetooth device to DV1230

"LINK OK" is displayed when DV1230 is paired and connected with another Bluetooth device.

If the Bluetooth device supports A2DP, you can stream music from the Bluetooth device to DV1230 for playback.

To play audio through Bluetooth, you must activate Bluetooth mode on your mobile device. If the Bluetooth device supports AVRCP, you can use the basic audio playback control functions (such as play/pause) from DV1230.

Note: In other modes (except during a call via Bluetooth), press **BT** on the front panel to switch between different modes.

Set up Bluetooth connection using NFC (only supporting mobile phones with NFC function)

1. Enable the NFC function of your mobile phone and make sure the screen is active and unlocked.
2. Move your mobile phone towards DV1230 so that the NFC detection area on your mobile phone touches that on DV1230. You can now connect your mobile phone with or disconnect it from DV1230 conveniently.

Note: For first-time pairing and connection, you will be asked to enter a password. Please enter "0000".

App Operation

- With the Furrion ES control App (either Android or iOS version), you can use your mobile device as a remote control.
- The App uses BT Low Energy (BLE) technology to connect to DV1230 instead of infrared in the physical remote control, thus getting free of line-of-sight connection.
- While the App checks for compatibility, you can cross-check the specifications of your mobile device to see if it supports BLE technology before installation.
- Find and download "Furrion ES Control" from Google Play (Android) or App Store (iOS) on your mobile device. Run the App as instructed.
- The App works with various models in the Furrion DV range entertainment system.

Install and use the App

1. Install the ES Control App on your mobile phone.
2. Enable Bluetooth on your mobile phone, and run the APP.
3. Select the device name "**DV1230-4.0-XXXX**" (where **X** can be any character of **A-Z** or number **0-9**) to connect.
4. Use the available functions on the App to control DV1230 freely.



Maintenance

Maintenance and Cleaning of Discs

Disc Maintenance

1. To keep the disc clean, handle the disc by its edge, and do not touch the disc surface of the play side.
2. Do not stick paper or tape on the disc. If there is glue on the disc surface, wipe it off before using.
3. Do not expose the disc to direct sunlight, or nearby heat sources such as caliduct, or leave it in a car parked in direct sunlight where there can be a considerable rise in temperature.
4. Put the disc inside a disc case after finishing playback.

Disc Cleaning

1. Before playing, wipe the disc with a clean cloth, wipe the disc outwards from the disc center.
2. Do not use petrol, thinners, commercially available cleaners or anti-static sprays for plastic LPs to wipe discs.



correct



wrong



correct



wrong



Troubleshooting

English

Please read the user manual carefully before using the product. If you have any problems with this product, please refer to the below troubleshooting guide to help you resolve the issue.

TROUBLE/SYMPTOM	SOLUTION
No picture, sound and indication	Ensure that the power switch is on.
	Ensure that the wall inlet is OK.
	Ensure that the power cord is not damaged or the fuse is not blown.
	Ensure that the power connection is OK.
No sound but picture OK	Ensure that the audio output of the unit is in good connection with the TV's audio input.
	Check whether the audio connector is damaged.
	Check whether you have turned down the volume.
	Ensure that the AUDIO setup of the unit is correct.
Black and white picture or screen rolling	Ensure that the audio is not muted.
	Ensure that the TV SYSTEM (e.g. PAL, NTSC) setup is correct.
	Ensure that the video output of the unit is in good connection with the TV's video input.
	Ensure that you have turned your TV to the AV input channel connecting to the unit.
No picture but sound OK	Check whether the video connector is damaged.
	Ensure that the VIDEO setup of the unit is correct.
	Check whether AUDIO setup is correct.
	Check whether the disc is scratched or stained.
Flaws in picture or sound	Check whether the AV connector and output terminal are stained.
	Check whether there is condensation inside the lens. If so, leave the unit off for an hour or so, and then try again.
	Check whether the installation angle is less than 30°.
	Check whether the disc is distorted.
No disc or bad disc	Check whether the disc is stained or scratched badly.
	Ensure that the disc format is compatible with the unit.
	Ensure that the temperature inside the car is not too high. If so, let the unit cool off until the ambient temperature returns to normal.
	Insert another disc into the disc slot.
	Ensure that you have inserted the disc into the disc slot.
	Check whether the disc has been put in the reverse side.



Troubleshooting

TROUBLE/SYMPTOM	SOLUTION
Remote control does not work	Check the battery of the remote control and make sure that it is not dead.
	Direct the remote control to the IR sensor of the unit.
	Check whether there are obstacles between the remote control and IR sensor.
Some function buttons do not work	Turn off the power, then turn on again.
	Reset the unit, then turn on again.
	Remove the front panel from the unit, then put it back and turn on again.
The radio does not work	Check whether the antenna cable is connected firmly, or manually tune for a station.
Functions locked or no response for Bluetooth function	Press RESET with a sharp object such as a clip to reset the unit and load its factory default settings.

English



Warranty

English

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SEELEVEL II™

RV Tank Monitor



MODEL 709-P3 MANUAL

IMPORTANT OPERATOR INFORMATION

DATE INSTALLED: _____

SERIAL NUMBER: _____

	Signal Level	Sender Height
Black Water Tank		
Grey Water Tank		
Fresh Water Tank		

Printed in Canada

CANADA
Garnet Instruments
286 Kaska Road
Sherwood Park, AB T8A 4G7

USA
Garnet US Inc.
5360 Old Granbury Road
Granbury, TX 76049

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SEELEVEL II TM

Tank Monitor

MODEL 709-P3


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SAFETY SYMBOLS INFORMATION

"Notes", "Cautions", and "Warnings" have been used throughout this manual to bring special matters to the immediate attention of the reader.

 **NOTE:** expands on information for any procedures.

 **CAUTION:** explains safety information that could cause damage to the product, including data loss.

 **WARNING:** explains dangers that might result in personal injury or death.



CHAPTER 1 - OVERVIEW

The **SEELVEL II**™ Tank Monitor represents a massive leap forward in level measurement technology for the Recreational Vehicle industry. The SEELVEL™ has a combination of features, accuracy, reliability, and diagnostic capability that have never been available before.

Model 709-P3 will monitor the battery voltage, the fresh water and sewer holding tanks, and includes a pump switch. The information is displayed on a 3-digit alpha-numeric LED display. In addition, the system can display the operating characteristics of each of the tank sending units, giving it unsurpassed diagnostic capability.

⚠ WARNING: All power circuits must be fused. If a fuse is not provided with the system then it is the installer's responsibility to install a fuse with a maximum rating of 7.5 amps. A relay is required if more than 7.5 amps is needed for the pump.

For more detailed information please refer to Chapter 7

"TROUBLESHOOTING GUIDE" and section **"How to avoid damaging the display or pump switch due to excessive current"**.



CHAPTER 2 - SYSTEM DESCRIPTION

The SeeLevel consists of a display unit that mounts inside the RV, and sender panels that stick to the side of the holding tank. A single 2 conductor wire is used to connect all the sender panels to the display.

The Sender: Each sender panel is a flexible self-adhesive printed circuit board which is adhered to the side of the holding tank. The sender panel can be cut to length to match the height of the tank, and it auto calibrates itself so that it can read from Empty to Full regardless of the height of the tank. The sender scans the water level through the tank wall using advanced digital techniques programmed into the sender microprocessor. When the sender transmits the water or sewer level information to the display, it sends a digital code that has built in error detection, making it highly unlikely for the display to read an incorrect level, even if the wiring is marginal. In addition to the level, the sender also transmits diagnostic information about its operation. This information can be used to determine if there is buildup of sludge on the inside of the tank, or to determine if the sender is damaged or delaminating from the side of the tank. If sludge buildup in the tank becomes extreme the gauge will cease to operate properly, so by monitoring the signal power the tank can be cleaned before the buildup gets excessive. Three different sender options (710JS, 710ES, and 710SS) and the ability to double stack the senders provide accurate level measurement for tank heights ranging from 4½" to 34".

The Display: The display receives the information from the three sender panels via a single 2 conductor wire, and displays the level information in percent of full on a 3-digit LED display. When the button for a particular tank is pressed, the display shows the level for that tank. If the button is pressed and released, the display will show the level for about 5 seconds and then shut down automatically. If another button is pressed before the display shuts down, then the new level will immediately be shown. If the same water or waste button is pressed twice, the display will hold on that tank and continue to show updated levels for 5 minutes before shutting off. This allows the user to monitor the filling or draining of a tank. By pressing two buttons at once, the diagnostic functions can be accessed; these are described in detail in the troubleshooting chapter.



If a sender is operating properly and connected to the display with good wiring, then the display will show the level normally. If the wiring is disconnected, shorted, or cut, or if the sender panel is defective, then the display will indicate an error code. The various error codes are shown in the troubleshooting chapter.

With these diagnostic features and the digital nature of the tank level sensing technology, it is almost impossible for the system to indicate an incorrect water level, and in the very unlikely event it does occur, servicing is greatly aided with the diagnostic information.

The system also shows the RV battery voltage by measuring the voltage which powers the display. The voltage is shown with a resolution of 0.1 volt.



CHAPTER 3 - OPERATING INSTRUCTIONS

The display is the only system component that is accessed by the user. All user input to the display is done using the four buttons along the bottom of the display. Operation of the display is as follows:

To read a water or sewer tank level:

1. Press the button corresponding to the tank to be checked and release it, the display will show the level in percent on the LED display. If no other button is pressed, then the display will shut off after about 5 seconds.
2. If another button (including **BATT**) is pressed before the 5 second time is up for the first button, the display will immediately switch to showing the new level or voltage. The 5 second timeout is restarted every time a button is pressed.
3. To continuously display a reading, press and release the desired button, and then press the same button a second time. When the button is released, the display will be in hold mode, which is indicated by the decimal point on the right hand side turning on. While the display is in the hold mode it will recheck the level once per second so the user can watch the level change while the tank is being filled or drained. The display will automatically shut off after 5 minutes in hold mode. To end the hold mode before the 5 minutes is up, press any tank button, and the display will shut off.

To read the battery voltage:

1. Press the **BATT** button and release it, the display will show the battery voltage on the LED display.
2. If no other button is pressed, then the display will shut down after about 5 seconds. If the **BATT** button is held down, the display will continuously recheck the voltage and show the updated value. The reading may flicker back and forth between two values, for example, 12.6 and 12.7 volts. This is normal behavior for a digital voltage display.
3. If another button is pressed before the 5 second time is up for the **BATT** button, the display will immediately switch to showing the value for the new button. The 5 second timeout is restarted every time a button is pressed.
4. There is no hold mode for the battery voltage.



CHAPTER 4 - DISPLAY CALIBRATION

To program the LED brightness:


1. If the display is to be used inside the coach, the LED brightness should be low. If it is to be used in the service bay area where sunlight can reach it, the LED brightness should be high.
2. To program the LED brightness, the display needs to enter the brightness programming mode. To do this, press and hold down the **BATT** button, the display will show the battery voltage.
3. While continuing to hold down the **BATT** button, press and hold down the **GREY** button. Continue to hold down both buttons for about 5 seconds until the display shows "**bri**" to indicate the brightness programming mode. When this occurs release both buttons.
4. The display will now indicate the brightness that is currently programmed by showing "**b-1**", "**b-2**", "**b-3**", or "**b-4**", where "**b-1**" is the minimum brightness and "**b-4**" is the maximum brightness.
5. Press the **GREY** tank button to increase brightness, or the **FRESH** tank button to decrease brightness.
6. When the display shows the correct brightness, press the **BATT** button to exit the programming mode.

To program the number of senders for each tank:

1. To program the number of senders for each tank, the display needs to enter the sender programming mode. This should only be done at the time of installation, there is no reason to change the number of senders afterward. Make sure that the number of senders programmed into the display matches with the number of senders connected, otherwise the display will show an error.
2. To enter the sender programming mode, press and hold down the button for the tank to be programmed, the display may show a level or an error message for that tank.
3. While continuing to hold down the button for the tank, press and hold down the **BATT** button. The display will immediately show "**dIA**" (diagnostics), continue to hold down both buttons until the display enters the programming mode, this should take about 5 seconds.



4. When the programming mode is entered, the display will show "**FrS**" if entering the number of senders for the fresh tank, "**GrS**" if entering the grey tank, or "**bLS**" if entering the black tank. When this occurs release both buttons.
5. The display will now show "**1SE**" (one sender) or "**2SE**" (two senders), based on what is currently programmed into the display. These are the only two options, the display will not work with more than two senders per tank.
6. To change the number of senders, press the tank button, each time the button is pressed the display will switch to the other number.
7. When the display shows the correct number of senders, press the **BATT** button to exit the programming mode. Each tank will need to be calibrated individually using this procedure.

 **NOTE:** The battery voltage is calibrated at the factory; this should never need to be changed.



CHAPTER 5 - SENDER PROGRAMMING

To program the 710ES or 710SS sender for the correct tank:

1. Since the senders are all connected in parallel to save wiring and to simplify installation, the senders must be programmed so they know which tank they are on. The senders can be programmed for either the fresh, grey, or black tank. This is done with the two tabs on the top corners of the sender. See the following diagram.
2. The senders default to fresh tank operation if the programming is not altered. Consequently, if the sender is for the fresh tank, nothing further needs to be done to it.
3. If the sender is for the grey tank, remove the tab that says "**GRY**" next to it.
4. If the sender is for the black tank, remove the tab that says "**BLK**" next to it.
5. This is all that is required to program the senders for the correct tank. However, if you make an error, you have one chance to correct it, as described below.
6. If the "**GRY**" tab has been removed and it should be a black tank sender, or if the "**BLK**" tab has been removed and it should be a grey tank sender, then cut out the recessed grey-black correction tab that says "**GBC**" next to it. This reverses the effect of the grey and black tabs.
7. If either the "**GRY**" or "**BLK**" tabs have been removed and it should be for a fresh tank, then remove the other "**GRY**" or "**BLK**" tab. When both the "**GRY**" and "**BLK**" tabs are removed, it is equivalent to neither of them being removed.
8. If the sender is single, no further programming is required.
9. If double stacked senders are used, the top sender must have additional programming, as described below.
10. Refer to the 710ES and 710SS sender programming diagram.

To program the 710ES or 710SS sender as top or bottom:

1. Since the senders are all connected in parallel to save wiring and to simplify installation, the senders must be programmed so they know whether they are a single, top, or bottom sender. This is done with the tab at the top center of the sender. See the following diagram.



2. The senders default to single or bottom operation if the programming is not altered. Consequently, if the sender is for single or bottom operation, nothing further needs to be done to it (beyond programming it for the correct tank).
3. For a top sender, remove the tab that says "**TOP**" next to it.
4. This is all that is required to program the senders for single, top, or bottom use. However, if you make an error, you have one chance to correct it, as described below.
5. If the "**TOP**" tab has been removed and it should be a single or bottom sender, then cut out the recessed top correction tab that says "**TC**" next to it. This reverses the effect of the top tab.
6. Verify that both the top and bottom senders have been programmed for the correct tank.

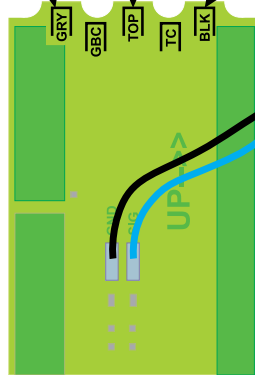
To program the 710JS sender for the correct tank:

1. Since the senders are all connected in parallel to save wiring and to simplify installation, the senders must be programmed so they know which tank they are on. The senders can be programmed for either the fresh, grey, or black tank. This is done with the two tabs on the top corners of the sender. See the following diagram.
2. The senders default to fresh tank operation if the programming is not altered. Consequently, if the sender is for the fresh tank, nothing further needs to be done to it.
3. If the sender is for the grey tank, remove the tab that says "**GRY**" next to it.
4. If the sender is for the black tank, remove the tab that says "**BLK**" next to it.
5. This is all that is required to program the senders for the correct tank. However, if you make an error, you have one chance to correct it, as described below.
6. If the "**GRY**" or "**BLK**" tab has been removed by mistake, the sender can be changed to a fresh tank sender by cutting the other corner tab ("**GRY**" or "**BLK**").
7. Refer to the 710JS sender programming diagram.

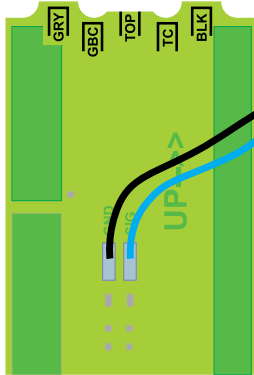


There are no tab cuts for FRESH SINGLE or BOTTOM sender programming

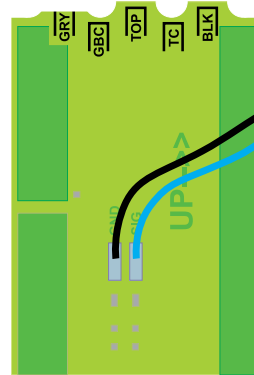
Cut for TOP sender
Cut for GREY tank



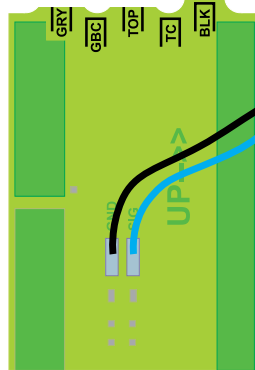
Tab cut for FRESH TOP sender programming



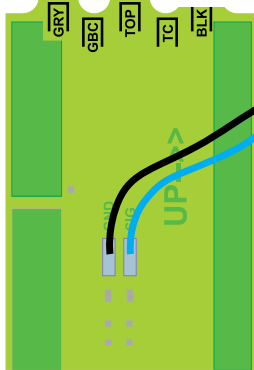
Tab cut for GREY SINGLE or BOTTOM sender programming



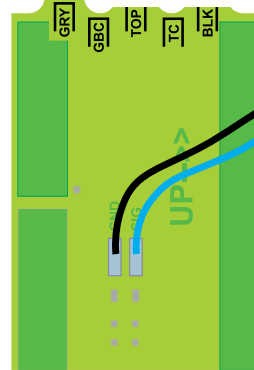
Tab cuts for GREY TOP sender programming



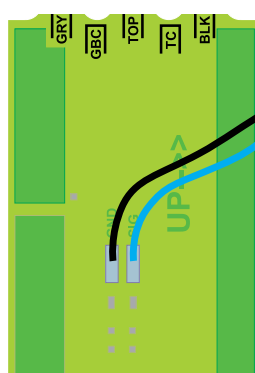
Tab cut for BLACK SINGLE or BOTTOM sender programming



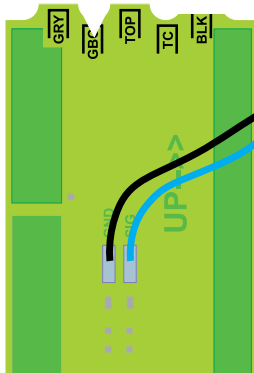
Tab cuts for BLACK TOP sender programming



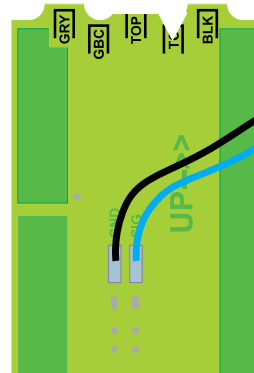
Example of corrected FRESH TOP sender programming (GRY or BLK tab cut by mistake)



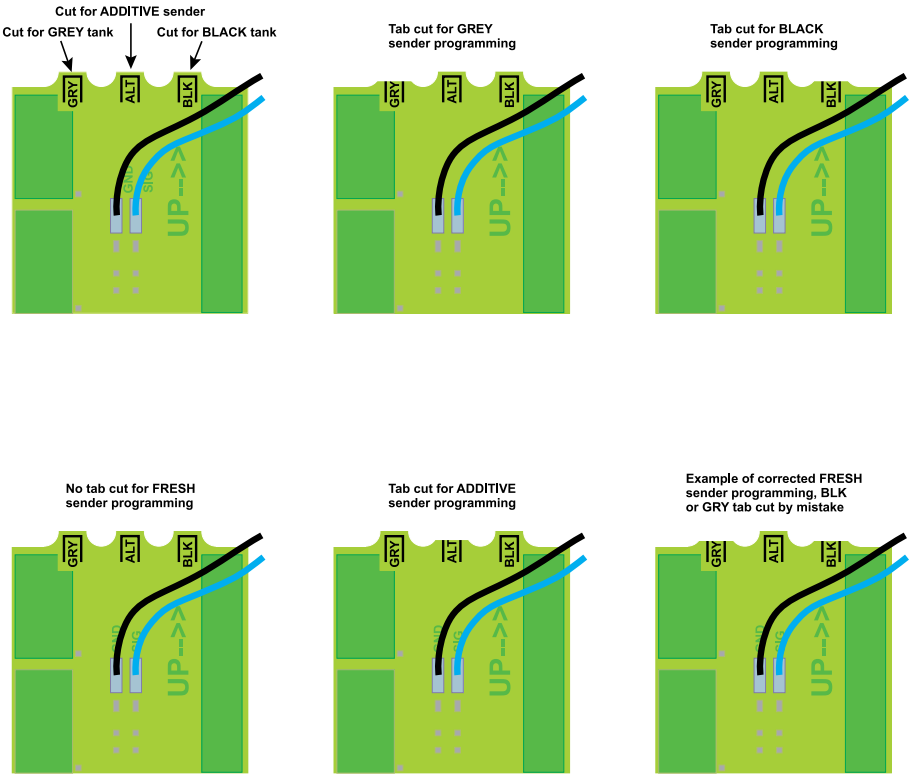
Example of corrected GREY SINGLE or BOTTOM sender programming (BLK tab cut by mistake)



Example of corrected FRESH SINGLE or BOTTOM sender programming (TOP tab cut by mistake)



710ES AND 710SS SENDER PROGRAMMING



710JS SENDER PROGRAMMING



CHAPTER 6 - INSTALLATION GUIDE

1. Please refer to the **"Troubleshooting and Installation Tips"** section in Chapter 7 for details on avoiding installation issues.
2. The installation consists of mounting the display inside the RV, cutting and fastening the senders to the sides of the holding tanks, connecting wiring, and programming the display. When wiring DO NOT use spade connectors to join wires, only use crimp on butt connectors or solder the wires together.
3. Mount the display by cutting a hole in the wall 3" wide by 1 7/8" high and bringing the wiring out through the hole to connect to the display panel connector.
4. Connect the wiring according to the following table. It is easier to connect the wiring to the display connector first, and then plug the connector into the display panel. The senders need to be grounded to a single ground wire from the display. Make sure that the system ground is connected to the breaker panel ground.

Wire Color	Function
Red 18 gauge	+12V power input to monitor
Black 18 gauge	Ground
Blue 18 gauge	Tank senders
White 18 gauge	Pump indicator

5. Determine where to mount the senders on the tanks. They will need to have a flat area on the side of the tank large enough so the whole width of the sender is in contact with the side of the tank, all the way from the top to the bottom of the tank. Make sure that any metal is at least an 1" away from either side or the top and bottom of the sender, and at least 2" away from the face of the sender. Clean the area well so that there is no dust, grease, oil, water, etc., that would prevent the adhesive on the sender from sticking.
6. Measure the height of the tank to determine which sender configuration to use and how long the senders should be. Refer to the following table.

⚠ CAUTION: DO NOT mix sender types when stacking senders.



Tank Height	Sender Options	
	Best Resolution	Other Acceptable
4½" - 5"	JS	-
5" - 7"	JS	ES
7" - 13"	ES	SS
13" - 17"	stacked ES	SS
17" - 25"	stacked ES	stacked SS
25" - 34"	stacked SS	-

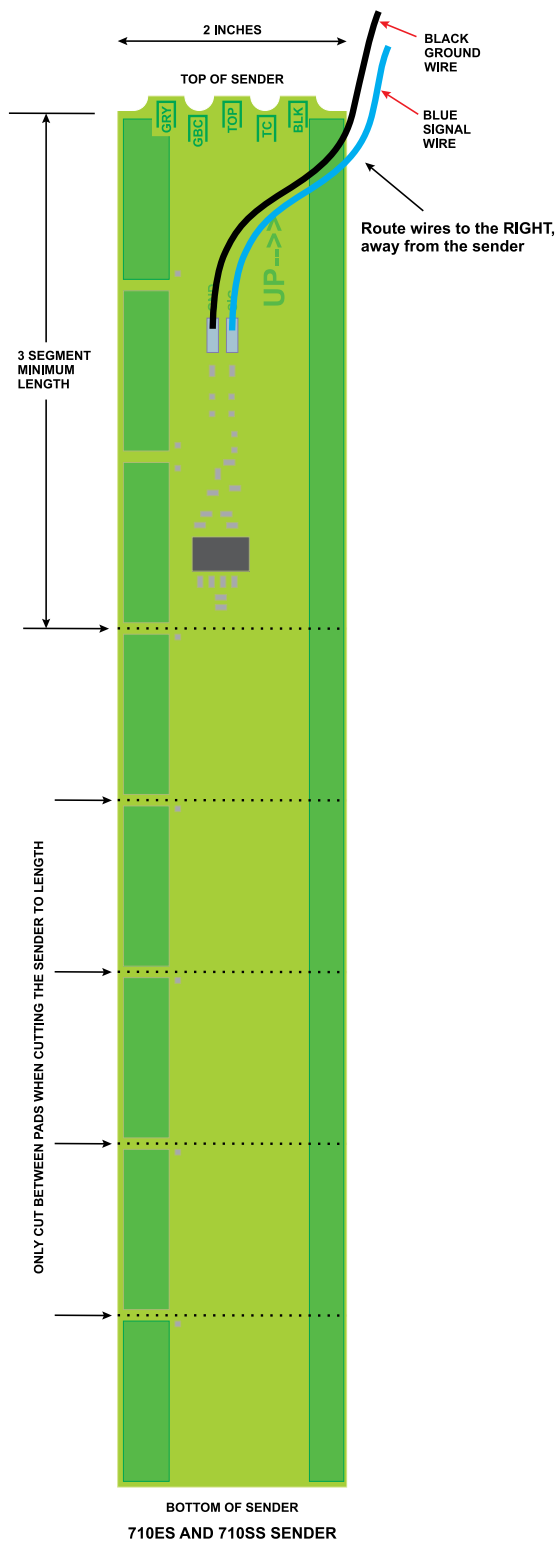
For single sender applications:

The sender ends should be ¼" to ¾" away from the top and bottom of the tank, to allow for the thickness of the tank top and bottom and any bows in them (see the diagrams). The senders are calibrated to account for this distance from the bottom of the tank. The SS sender is cut to the nearest even 2" in length. The ES sender is cut to the nearest even 1.5" in length, for example, for a system with a tank height of 11.75", cut the sender to be 10.5" long, this allows ⅝" at each end when the sender is centered vertically on the tank. The JS sender is cut to the nearest 1.0" in length.

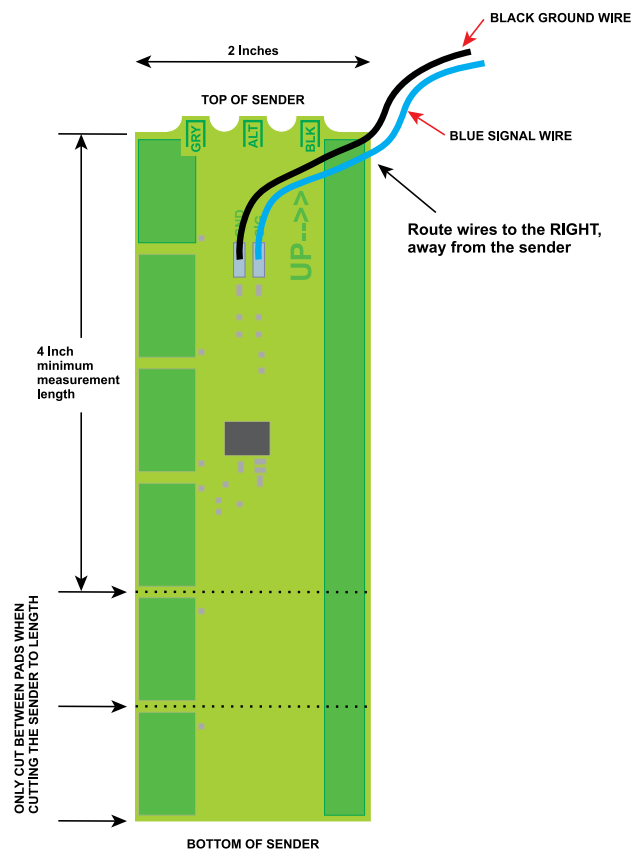
⚠ CAUTION: DO NOT cut the 710SS sender shorter than 6". This sender will not work if it is cut shorter than 6". DO NOT cut the 710ES sender shorter than 4 1/2". This sender will not work if it is cut less than 4 1/2". DO NOT cut the 710JS sender shorter than 4". This sender will not work if it is cut less than 4".

For double stacked sender applications:

For tall tanks, double stacked 710ES or 710SS senders are used. The sender ends should be ¼" to ¾" away from the top and bottom of the tank, to allow for the thickness of the tank top and bottom and any bows in them (see the diagrams). The senders are calibrated to account for this distance from the bottom of the tank. In addition, there needs to be a gap of ⅛" to ¼" in between the double senders. Therefore the total length of both senders will be: tank height - ¼" - ¼" - ⅛", then rounded down to the nearest 1.5" (ES sender) or 2" (SS sender). The top and bottom senders should be approximately the same length for best results. For example, if the tank height is 22", then $22" - \frac{1}{4}" - \frac{1}{4}" - \frac{1}{8}" = 21 \frac{3}{8}"$, so the total length of both ES senders will be 21". Make both senders 10.5" long.



710ES AND 710SS SENDER



710JS SENDER



7. To make the senders the right length (assuming they are too long) they will need to cut off with a pair of scissors. The end to be cut is the bottom end, which is the opposite end from

⚠ CAUTION: DO NOT cut the sides, and DO NOT cut the 710ES sender shorter than 4 ½". The cut must be in between the sensor pads, and the cut must be made parallel to the existing bottom end. Double check your measurements, if the sender is cut too short, it cannot be lengthened.

8. The senders need to be programmed so they know which tank they are on. This is done by selectively cutting off the tabs on the top of the sender. See the chapter entitled "**SENDER PROGRAMMING**" for details.
9. For double stacked sender systems, the senders also need to be programmed so they know whether they are being used as top or bottom senders. See the chapter entitled "**SENDER PROGRAMMING**" for details.
10. Once the sender is cut to length and programmed, do a test by taping the sender to the tank wall. Make sure there are no air gaps between the sender and the tank. Verify operation before permanently sticking the sender to the tank wall. Once proper operation has been confirmed, carefully peel the backing paper off the adhesive. Do this slowly to prevent the adhesive from being ripped off the sender, and to prevent the backing paper from ripping. Be careful not to bend the sender sharply in the process. Position the sender over the side of the tank and carefully stick it down.

⚠ CAUTION: Make sure that the end with wires is pointing up!!

Position the bottom of the sender at least ¼" above the bottom of the tank, or slightly higher if required to equalize the space at the top and bottom of the tank. Make sure that the sender is square with the tank. You only have one shot at this, if you try to peel it off the tank once it is stuck the sender may be damaged by the sharp bending. Carefully press the sender down to the tank so that all of the adhesive is contacting the tank wall.

11. Do steps 5 to 10 for the other two holding tanks.
12. Connect all the blue wires from the senders together, and to the blue wire from the display. Connect the black wire from each sender to ground at the display. It is very important that the display and the senders have the same ground. Use crimp on butt connectors to fasten the wires together.



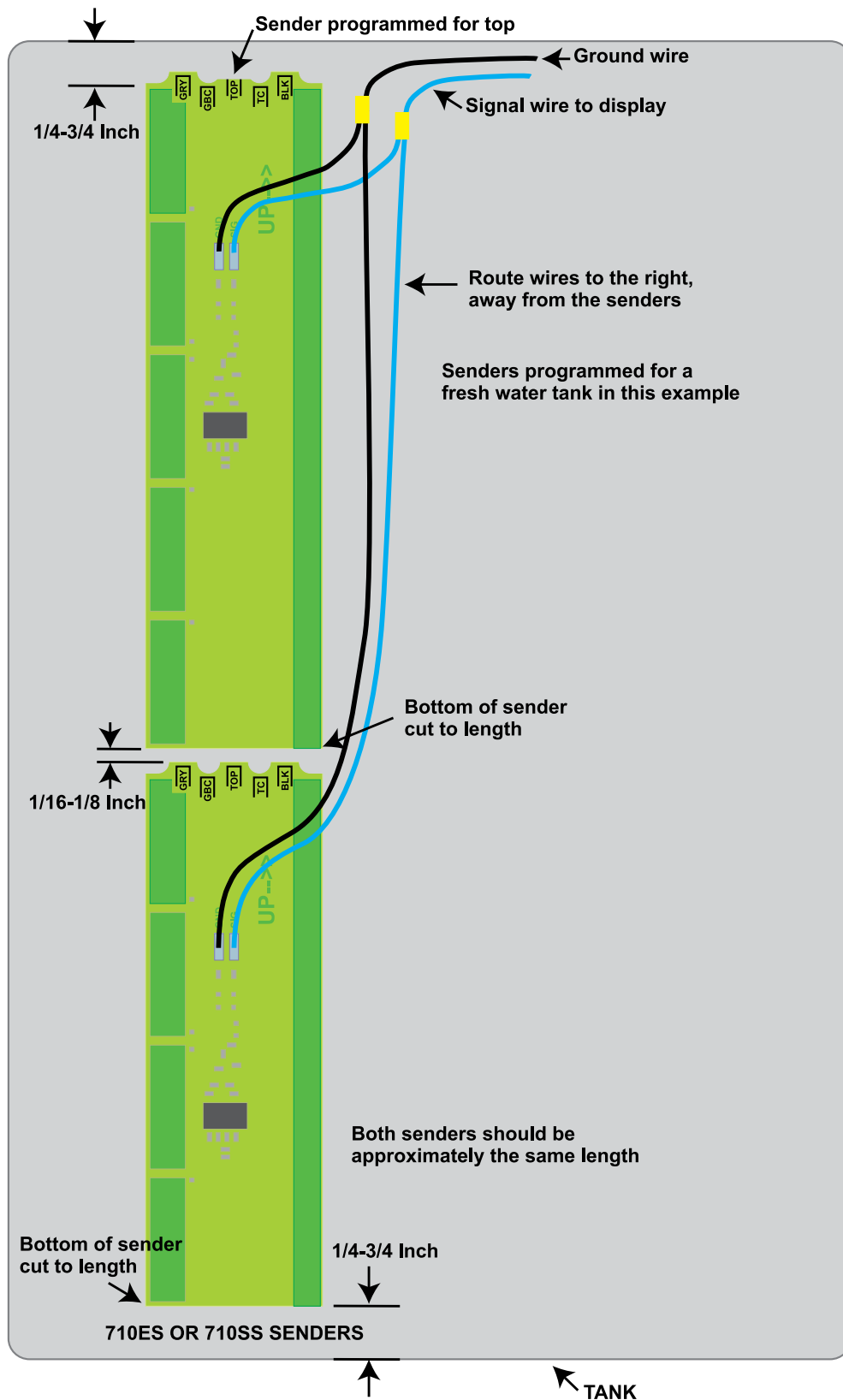
⚠ CAUTION: Make sure that the wires from the sender are routed to the RIGHT side of the sender, away from the sender. NEVER route the wires to the left of the sender. If they drape over the sender they could affect the reading.

Secure the wires with tie wraps or something similar so that the wires do not rattle or press against the sender, this may result in sender damage or wires breaking over time. Refer to the enclosed wiring diagrams.

13. All that remains now is calibration and testing. The tank senders will self calibrate to whatever length they are cut, so they will always read from 0% to 100%. The display needs to be set to a single or double sender system for each tank. See the chapter entitled **"DISPLAY CALIBRATION"** and the section **"To program the number of senders for each tank"** for details. Make sure you do it for each tank.
14. For the initial test, have the tank at least $\frac{1}{4}$ full of water or sewage, and verify that the percent level reading looks correct (see the chapter entitled **"OPERATING INSTRUCTIONS"** and the section **"To read a water or sewer tank level"** for details). Check to see that the signal power is at least 20% (see the chapter entitled **"TROUBLESHOOTING GUIDE"** and the section **"To review the sender diagnostics"** for details). If the signal power is too low, make sure that the sender(s) is well stuck to the side of the tank and that the tank is reasonably clean inside, as a large buildup will reduce signal strength. The gauge will work with maximum signal strengths as low as 20%, but it is good to have at least 50% to 60% at installation so that there is some margin available for buildup in the tank. Note that the system "learns" about the characteristics of the tank with use, so the readings may be inaccurate when the tank is empty or almost empty when the system is first tested. Once the tank has been filled at least $\frac{1}{4}$ full the system will be properly "taught" and should read correctly after that.
15. If equipped, connect the pump switch as required.

⚠ WARNING: The pump switch is rated for a maximum of 7.5 amps. The use of a relay is required if more than 7.5 amps is needed. A 7.5 amp (max) fuse must be installed in the series with the 12V power circuit to the switch!

16. Verify that the battery voltage reads correctly. If it appears low, make sure you have good wiring for the 12 volt power and the ground.











Typical Double Stacked 710ES or 710SS Sender Installation



CHAPTER 7 - TROUBLESHOOTING GUIDE

If a sender or its wiring is not operating properly, the following codes are shown on the display:

DISPLAY CODE	POSSIBLE CAUSE	SOLUTION
Open circuit  LEVEL IN PERCENT	<ol style="list-style-type: none"> 1. If a sender is unresponsive. 2. There is an open circuit in the wiring so the sender is not connected. 	See "Wiring Diagnostics" section.
Short circuit  LEVEL IN PERCENT	<ol style="list-style-type: none"> 1. A sender is shorted or there is a short in the wiring. 	See "Wiring Diagnostics" section.
Error  LEVEL IN PERCENT	<ol style="list-style-type: none"> 1. Senders have not been programmed correctly. 2. The sender is sending bad data. 3. There is damaged wiring. 4. There is electrical interference. 	Check all the senders to make sure they are programmed correctly. If they are, replace the sender that is creating the error.
Stacked senders  LEVEL IN PERCENT	<ol style="list-style-type: none"> 1. The display has been programmed for a single sender where double-stacked senders have been connected. The display has not been set to look for two senders 	Change the senders or reprogram the display as required.
No top sender  LEVEL IN PERCENT No bottom sender  LEVEL IN PERCENT	<ol style="list-style-type: none"> 1. The display has been programmed for stacked senders and the top sender has been connected. 2. The display has been programmed for double-stacked senders and one of these error codes are showing: <ul style="list-style-type: none"> • ntP - only the bottom sender is working and <u>the top one is not</u>. • nbo - only the top sender is working and <u>the bottom is not</u>. 	Correct the programming on the sender.
Calibration failure  LEVEL IN PERCENT	The memory used to store programming for battery voltage calibration value and tank sender signal values has failed.	Replace the display.
For LPG only  LEVEL IN PERCENT	The only LPG diagnostic code is the open circuit. If the wiring to the LPG sender is shorted then the LPG will always show "O".	

NOTE: There are no diagnostics for battery voltage.



The diagnostics can be used to check the wiring and the senders:

1. If a short circuit is showing, disconnect the senders one at a time at the sender location. If the short circuit indication goes away when a sender is removed, then that sender is bad. If all the senders are removed but a short circuit still shows, then the wiring may be shorted. Disconnect the sender wire at the display, the short indication should go away. If it doesn't, the display is bad.
2. If an open circuit for all the senders is showing, it is most likely a wiring open circuit or display failure, since it is unlikely that all three senders are bad. Try shorting the wiring together at the display, the display should indicate a short circuit. If it doesn't, the display is bad. If it does, then remove that connection and short the wires together at the sender locations. If no short circuit is shown, then the wiring is open. If the display does show a short circuit, then the senders must be bad.
3. If a single sender is showing an open, try shorting the wiring together right at that sender. If a short now shows, the sender is bad or not wired properly. If no short circuit shows on the display, the wiring to that sender is open.

To review the sender diagnostics:

1. The sender diagnostics can be reviewed periodically to check for any degradation of the tank senders. If a sender appears to be malfunctioning, reviewing the diagnostics should be the first step in the troubleshooting process.
2. There are two diagnostics for the senders: the signal power, and the sender height.

The signal power is an indication of how much signal is being transmitted through the tank wall and picked up by the receive part of the sender. If the signal power is too low, it can indicate a sender which is detached from the tank, excessive buildup on the inside of the tank, bad wiring to the sender, low battery voltage, or a defective sender. Typical signal power should be 50% to 60%. The minimum signal power for proper operation is 20%.

The sender height is the number of receive segments present in the sender. To determine the length of the sender, multiply the calibration by 2.0 (SS sender) or 1.5 (ES sender) or 1.0 (JS sender) to get the length in inches. The senders always auto calibrate to the length that they are cut, so this diagnostic allows the user to confirm the length and to make sure that the auto calibration is working properly.



3. To check the diagnostics, press and hold the button for the tank to be checked, the display will show the level for that tank.
4. While continuing to hold down the button for the tank, press the **BATT** button. When the display shows "dIA", release the buttons, the display will then change to showing the signal power diagnostic. This is indicated by a "P" showing on the left digit, for example "P26" indicates a 26% signal power.
5. The signal power will show for 5 seconds. The display will then change to showing the sender height. This is indicated by a small "h" showing on the left digit, for example "h 6" indicates that the sender has 6 receive segments, which is 6" high for a JS sender, 9" high for an ES sender, or 12" high for an SS sender.
6. After 5 seconds of showing the height, the display will shut off.

TROUBLESHOOTING AND INSTALLATION TIPS

What to do if the system freezes or is unresponsive:

1. If the display is unresponsive, it may be "hung" due to a static discharge or electrical noise. Try rebooting it by shutting off the 12V power to it for a few seconds, then turning it back on.

What to do if operation becomes erratic or stops completely:

1. Make sure all wiring connections are solid. Do not use spade connectors to join wiring as they will degrade over time. Use insulated crimp-on butt connectors or solder and insulate the wire connections.

What to do in dual console systems if the two displays do not read the same:

1. For dual display console applications, if the consoles disagree the most likely reason is a bad console ground. Both console grounds, and the sender grounds, must be connected together with ground wiring. Do not depend on metal chassis components. See item 2 in the following section for further details.

What to do if readings jump or are inaccurate

1. We have had a few instances where 120VAC interference has caused the readings to stall and create a gap; readings would skip from 50% to 70% and then begin to function again. The cause was wiring between consoles and senders being tied



too close to entrance boxes for shore power or bundled with other high AC voltage lines or junction boxes.

2. Always ground the senders and the console to the same ground circuit. This is very important; RV's can have several ground circuits with resistance between them. We have had instances where two consoles are installed with a different ground for the service bay console and interior console. If you see different levels from each console on the same tank, then the ground circuit is not common. Connect both consoles to the same ground back to the breaker panel ground point.

What to do if the system indicates a residual or non-zero water level even though the tank is drained completely:

1. This can be due to a convex tank bottom or a sloped tank bottom. In the case of the convex bottom tank a ring of water may remain after draining. In the case of the sloped bottom (to the drain valve side) a very small amount of water left in the tank will result in a non-zero level indication. In both of these cases, temporary installation of the sender using duct tape or masking tape will allow the installer to check the tank level before committing to a final sender position. After cutting the sender to length and connecting the wires, be sure to tape down both sides of the sender to eliminate air gaps between the sender and tank surface which can cause low signal strength and unpredictable performance. The ends of the sender must be at least $\frac{1}{4}$ " to $\frac{1}{2}$ " away from the tank bottom and top to allow for wall thickness. The exterior bottom & top of the tank are not the same as the interior bottom & top; depending on the tank wall thickness the inside height is $\frac{1}{2}$ " to 1" shorter than the outside height. Knowing the wall thickness of your tank will allow you to find the optimal sender position; placing the sender where it can "see" the water will ensure proper level calculation and sender operation.
2. The signal strength should be in the 50% range for best performance. If the signal strength is in the 20% range it is indicative of a high resistance in a connector, a bad ground, or improper bonding of the sender to the tank (a possible air gap on one or both sides of the sender).
3. With the console installed you can check the level on each tank, if you get an indicated level of 10% to 20% and you know this is too high, reposition the sensor board as follows:

In the case of a convex tank bottom, usually found on large flat tanks, raising the sender is the best solution to accomplish a zero reading when the tank is empty. This may result in having to shorten the sender by an additional segment.



On sloped tanks, which are used to promote complete draining, one alternative is to measure the end of the tank opposite from the drain valve. It may be necessary to extend the wire harness to be able to measure on the optimal side. On the drain valve side, the best choice is to elevate the sender to avoid reading a puddle at the drain valve.

4. The close proximity of metal to the sender can be misinterpreted as water, since they have similar electrical characteristics. Any metal such as steel, aluminum, copper, or brass can affect the sender reading if it is closer than about 2" brackets, straps, pipes, ducts, etc. close to the sender you may have to move the sender away from them. Again, trial positioning using tape is necessary until the problem disappears. Flexible pieces of metal can be held away from the sender with rubber wedged between the sender and the metal. If the metal is off to the side of the sender, or just butting to the edge then it is usually not a problem, particularly on the right hand side of the sender.
5. Make sure that metal doors or covers are far enough away from the sender as well, once everything is closed up the positioning may change. The symptoms of exposure to large metal components are usually a non-zero reading when the tank is empty, or the level appearing to jump suddenly as the tank is drained or filled.
6. On fresh tanks there is sometimes a potential to not be able to use all the water in the tank, we suggest you elevate the fresh sender 1" off the tank bottom and position the top of the sender to allow for vent position (if the vent is on the side of the tank). This way you should see '0' before the pump starts to suck air. Some tanks have a sump style draw system, in this case there is no concern with unusable water, just allow for the wall thickness when positioning the sender board (usually 1/2" to 1" margin from the outer shell). If the sender is positioned above the vent then the maximum reading may be less than 100%.
7. There may be a buildup on the inside walls of black and grey tanks. We get calls occasionally about older coaches that have not been in service for a few years in which the black tank will now indicate a level even though it is empty. The likely cause is that the tank has a significant build-up, probably exceeding 1/4" to 1/2" thick! Redex is not an acceptable chemical to promote clean tank walls; it is far too slow to get the breakdown action started. Use an RV type of liquid chemical, we suggest Tissue Digester, Sensor Cleaner, or the latest we have used called Happy Campers Holding Tank Extreme Cleaner available at www.happycampersworld.com. The next time you take a



trip, leave with a high concentration of the chemical in the tank and approximately 30% full of fresh water. Hopefully you can drive for 2-3 days allowing the tank levels to rise through normal use. We recommend that you exceed the level that you see the system report when the tank is empty. After the sloshing and the soaking hopefully the build-up will be flushed away when the tank is drained and flushed. If you still have symptoms the treatment may required a few more times. The waste did not build up on the tank wall in one day, so it may not dissolve in one treatment! The build-up looks like water to the system since it holds a significant volume of water in the build-up area. It takes much more than a film or piece of tissue to cause the error.

What to do if the system reads a zero water level at all times, or does not reach 100%:

1. This may be due to excessive tank wall thickness. We have tested the sender on an actual tank with $\frac{3}{8}$ " wall thickness to ensure proper operation. If you encounter an excessively thick tank wall the symptom will be a zero reading regardless of the actual tank level. The cross check would be to test the sender on another tank by taping it in place temporarily, if it now works the tank wall thickness is well over $\frac{3}{8}$ ". You can also use a 1 gallon jug or a 5 gallon pail as a test tank to crosscheck operation of the sender.
2. A symptom we have seen is the sender will not indicate 100% when the tank is full. If the sender is positioned too high on the tank, then water cannot reach high enough on the sender for it to read 100%. The top of the sender must be at least $\frac{1}{4}$ " to $\frac{1}{2}$ " away from the top of the tank to allow for wall thickness.
3. Another possibility is a tank wall thickness issue that may occur at the corners or edges of the tank. This has not been a common issue, and the only correction you can make is to move the board slightly lower, away from the thick area.

What to do if sender delamination occurs:

1. We have had reports of the senders literally falling off the tanks or showing serious delamination. This is likely caused by a lack of tank surface preparation. Surface prep is very simple, wipe the area to be adhered to with products like Pro Bond, alcohol, or acetone. Do not use thinners because they leave residues which attack the adhesive. Ambient temperatures of less than 60°F or 15°C prevent the bonding agents in the



adhesive from working properly; use a heat gun to warm the tank surface if necessary. Also be sure the surface is dry, again a heat gun is the best way to dry the bonding area. Finally, the surface of the tank must be smooth. The adhesive works much better on smooth surfaces, if necessary use an orbital sander with fine grit paper (220 grit) to quickly accomplish the desired smoothness.

2. Another possibility is the wiring harness pulling on the sender. Make sure the wiring to the tank sender is well supported so that it does not put a load on the sender. Be sure to support all connecting harnesses; do not let the board support the harness, this will in time cause delamination of the board from the tank. One simple way to do this is to use Gorilla tape across the top of the sender at a 90 degree angle to the sender orientation, with the wiring held in place by the tape. The wires from the sender must be routed straight up or to the right for reliable operation.

How to protect the sender from road spray and debris:

1. On installations where the holding tank is exposed to under chassis road spray and flying rocks etc. we recommend the use of an auto body undercoat, which is easily purchased in auto parts stores. This tar based material clings well to the senders and protects from water and debris.
2. One material in particular is 3M Professional Grade Rubberized Undercoating, product code 03584. Another product that works well is a Dominion Sure Seal rubberized undercoating such as Gravel Guard Rocker Guard Coating.
3. After the system is completed and tested apply the undercoat over the complete board using two coats. Do not use lacquer, enamel paint, or plastic paint for auto bumpers as these contain chemicals that will dissolve the conformal coating on the board and cause malfunctions.

How to avoid damaging the display when mounting:

1. If mounting the display in a metal panel or wall there is a risk of permanent damage due to a jagged opening or too small of an opening. The metal panel can short circuit the display rendering it inoperable and requiring the installer to replace it. Ensure that the edges of the cutout are smooth and that no material is bent outward where it can dig into the display. Make sure that the cutout is large enough so that the display can be easily inserted without having to angle it. There is a 1/2" border all around the display to cover the edge of the hole, so



if the hole is a bit larger than the minimum requirement it will still be covered by the display.

2. When fastening the display to the panel, make sure that it is centered in the hole and not resting on one edge.
3. Non-conductive mounting spacers are available to help prevent damaging the display. Contact Garnet for further details.

How to avoid damaging the display or pump switch due to excessive current:

1. Please be aware that the water pump switch circuit has a limitation on current draw of 7.5 amps, some large pumps can draw over 10 amps. These high drain pumps must use a relay or the display console printed circuit will overheat and damage the display permanently.
2. If the 12V supply line from the electrical panel does not have a 7.5 amp fuse rating, please be sure to install the supplied fuse holder with a 7.5 amp automotive style fuse inline on the +12V red wire.

⚠ WARNING: All power circuits must be fused. If a fuse is not provided with the system then it is the installer's responsibility to install a fuse with a maximum rating of 7.5 amps. A relay is required if more than 7.5 amps is needed for the pump.



CHAPTER 8 - SPECIFICATIONS

Resolution	JS sender: 1/4" (6 mm) ES sender: 3/8" (10 mm) SS sender: 1/2" (13 mm)
Accuracy:	+/- 8% or better, limited by resolution and tank height and shape.
Temperature range:	+32 to +140 °F (0 to + 60 °C)
Sender materials:	0.008" thick glass epoxy circuit board with conformal coating for circuit protection. Laminated on the back with 3M 300LSE Bonding Adhesive.
Sender length range:	JS sender: 4" to 6", which will measure tank heights from 4 1/2" to 7". ES sender: 4 1/2" to 12", which will measure tank heights from 5" to 13" (single sender) and up to 25" (dual senders). SS sender: 6" to 16", which will measure tank heights from 7" to 17" (single sender) and up to 34" (dual senders).
Display mounting panel:	Black panel, approximately 4" wide by 2.8" high by 1" thick (102mm wide X 71mm high X 25mm thick). Panel screws to wall.
System power requirements:	Display requires 12 volts from the RV battery, the system will function from 11 volts to 16 volts. Current drain is less than 200mA.
Wiring:	A single two wire conductor required from the display to the senders. All the senders are wired in parallel. 12 V power and ground required for display.
LPG:	-
Pump switch:	The pump switch is rated for a maximum of 7.5 amps. The use of a relay is required if more than 7.5 amps is needed. A 7.5 amp (max) fuse must be installed in series with the 12V power circuit to the switch!



CHAPTER 9 - SERVICE AND WARRANTY INFORMATION

The warranty will only apply if the warranty has been registered online from the Garnet Instruments registration web page.

Go online to [/support.com/](http://support.com/) and select "Register Warranty".

DISCLAIMER OF WARRANTY ON HARDWARE

Garnet Instruments warrants equipment manufactured by Garnet to be free from defects in material and workmanship under normal use and service for a period of one year from the date of sale from Garnet or an Authorized Dealer. The warranty period will start from the date of purchase or installation as indicated on the warranty card. Under these warranties, Garnet shall be responsible only for actual loss or damage suffered and then only to the extent of Garnet's invoiced price of the product. Garnet shall not be liable in any case for labor charges for indirect, special, or consequential damages. Garnet shall not be liable in any case for the removal and/or reinstallation of defective Garnet equipment. These warranties shall not apply to any defects or other damages to any Garnet equipment that has been altered or tampered with by anyone other than Garnet factory representatives. In all cases, Garnet will warrant only Garnet products which are being used for applications acceptable to Garnet and within the technical specifications of the particular product. In addition, Garnet will warrant only those products which have been installed and maintained according to Garnet factory specifications.

LIMITATION ON WARRANTIES

These warranties are the only warranties, expressed or implied, upon which products are sold by Garnet and Garnet makes no warranty of merchantability or fitness for any particular purpose in respect to the products sold. Garnet products or parts thereof assumed to be defective by the purchaser within the stipulated warranty period should be returned to the seller, local distributor, or directly to Garnet for evaluation and service. Whenever direct factory evaluation, service or replacement is necessary, the customer must first, by either letter or phone, obtain a Returned Material Authorization (RMA) from Garnet Instruments directly. No material may be returned to Garnet without an RMA number assigned to it or without proper factory authorization. Any returns must be returned freight prepaid to: Garnet Instruments, 286 Kaska Road, Sherwood Park, Alberta, T8A 4G7. Returned warranted items will be repaired or replaced at the discretion of Garnet Instruments. Any Garnet items under the Garnet Warranty Policy that are deemed irreparable by Garnet Instruments will be replaced at no charge or a credit will be issued for that item subject to the customer's request.

If you do have a warranty claim or if the equipment needs to be serviced, contact the installation dealer. If you do need to contact Garnet, we can be reached as follows:

CANADA

Garnet Instruments
286 Kaska Road
Sherwood Park, AB T8A 4G7
CANADA
email: info@garnetinstruments.com

UNITED STATES

Garnet US Inc.
5360 Granbury Road
Granbury, TX 76049
USA
email: infous@garnetinstruments.com



GG750 AWNING

INSTALLATION SERVICE and REPAIR MANUAL REV 04122022



RV AWNING PRODUCTS

1361 CALLE AVANZADO, SAN CLEMENTE, CA 92673 (800) 382-8442 FAX (949)276-5500

www.girardrv.com



Upon receiving your shipment, it is your responsibility to check the contents. If any product is damaged upon receipt, it is your responsibility to refuse the shipment.

MODEL _____ SERIAL No. _____

MODEL _____ SERIAL No. _____

MODEL _____ SERIAL No. _____

MODEL _____ SERIAL No. _____



WARNING

To prevent the motor from overheating do not exceed
4 minutes of operation per hour.

ALL ELECTRICAL WORK MUST BE CARRIED OUT BY QUALIFIED PERSONNEL AND CONFORM TO APPLICABLE ELECTRICAL CODES AND STANDARDS.

- Turn off power before beginning any electrical work.
- Please consult your RV's wiring diagram to locate any wiring prior to any drilling or any installation procedures.



- Ensure that placement of controls, cables, and wires are not in any way obstructed. This can damage the components and obstruct electrical current.
- Use only certified components.



Girard Systems awnings may be operated in light wind and rain conditions. When periods of heavy rain and or high wind are expected the awning must be closed. Never leave the awning open and unattended.

Damage caused by wind and rain is not covered by warranty.

All awnings must be closed prior to moving the vehicle for any reason. As an extra safety precaution a visual check that every awning is fully closed is required.

Damage caused by failure to comply with these instructions is not covered by warranty.

Before using your awning, ensure that the area into which the awning will be deployed is free of obstructions (Trees, walls, pillars, posts, other vehicles etc.)

Damage caused by collisions with any of the above or similar is not covered by warranty.

Before using your awning make sure that all of your electrical circuits are operating correctly.



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BASIC SYSTEM OVERVIEW

1. Mechanical system – consisting of:

- The enclosure (or cassette) protects the awning while closed.
- The roller tube which is mounted within the cassette.
- The top cover or fabric rolled onto the roller tube and connected to the lead rail that extends from the enclosure when the awning is opened.
- The folding arms that supports the lead rail and the fabric.
- (Option) tubular motor which is mounted inside of the roller tube that controls the extension and retraction of the awning.
- (Option) manual crank handle and drive system that controls the extension and retraction of the awning

2. Electronic controls – (Option) to power and operate the motor

- Motor Control module – 98GC1146C. This works in conjunction with the other electronic controls and the user controls included in the installation to extend and retract the awning as required.
- Motion Sensor – 98GC779, which enables automatic retraction of the awning during periods of high wind that may damage the awning system.
- Wired Motion Sensor – 98GC780B, Wired motion sensor that works in conjunction with 98GC781B and 98GC783B wired wall switch controllers.

3. User Controls – (Option) Hand held remote controllers and wall mounted remote switches will differ according to the individual customer's needs, single or multi-channel handsets, with or without LED switching facility, and wall switches will differ depending upon how many awnings they are required to control.

- 98GC104 – Single channel awning remote control
- 98GC1063 – Single channel remote with LED switching
- 98GC229 – Single channel remote wall switch
- 98GC781B – Wired wall switch controller
- 98GC783B – Wired wall switch controller
- 98GGC101 – Dual Rocker Switch



98GC1146C



98GC779



98GC780B



AWNING REMOTE

SINGLE AWNING PART # 98GCK-57

DOUBLE AWNING PART # 98GCK-45D



INSTALLATION MANUAL

FOR PERSONAL SAFETY AND QUALITY OF INSTALLATION, TWO INSTALLERS ARE RECOMMENDED FOR THIS PRODUCT.



WARNING

To prevent the motor from overheating do not exceed 4 minutes of operation per hour. **Overheating will destroy the motor.**

PRODUCT DESCRIPTION

The GG750 awning system provides protection from the sun at a touch of a button. The GG750 awning is built to your specifications with the highest quality materials available, your unit features:

- A standard 12VDC motor that operates with a wireless motor control or rocker switch.
- Motion sensor that will retract the awning to prevent damage from the wind.
- A hand held remote control
- A wall mounted remote switch
- Options include; electronic automation controls to ensure proper closing at all times, a control to retract all awnings when the vehicles' motor is started, and more....

The GG750 awning controls use an RF (radio frequency) link to communicate with each other. This simplifies the installation and maintenance by removing the need for extensive wiring. This RF network is called the G-Link system. For more information please refer to the G-Link manual that was included with your awning. All necessary power cables are supplied with this product.



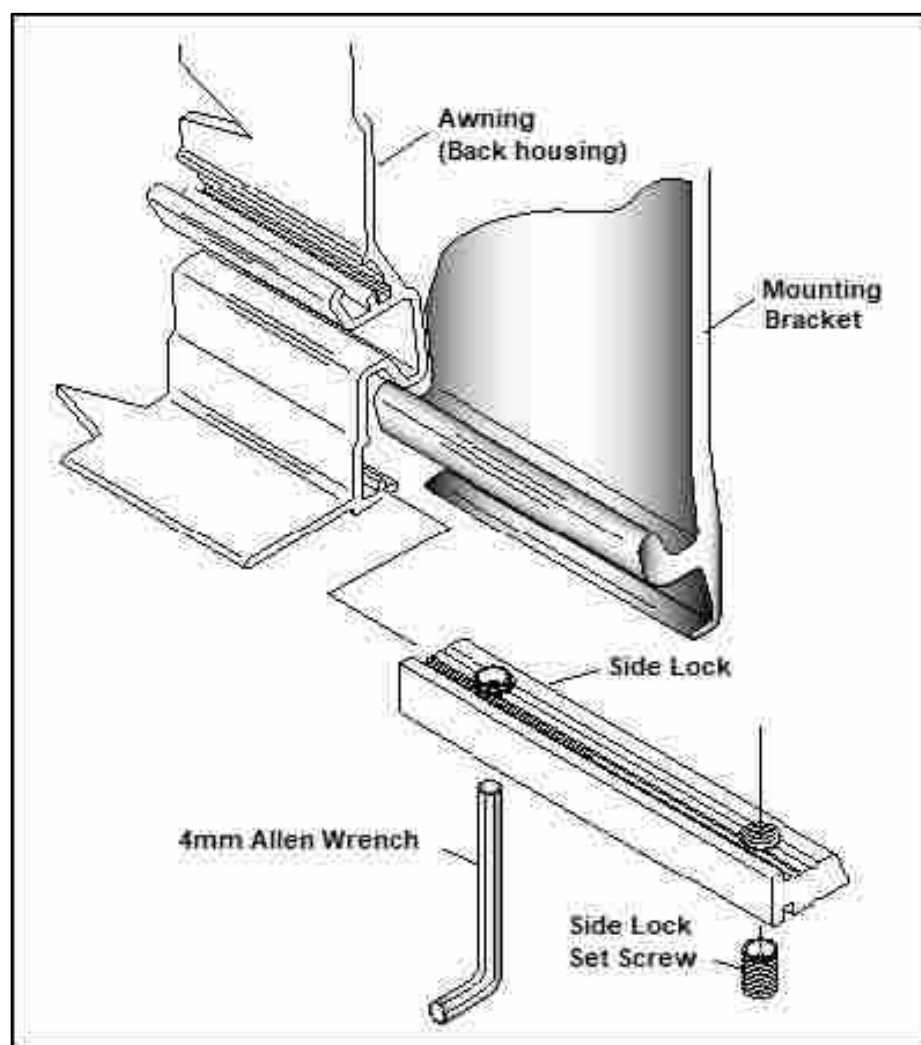
GETTING STARTED

Tools required:

- Electric Drill
- Tape measure
- (2) ladders
- Chalk line
- Flat head screwdriver (small)
- Phillips screwdriver
- Caulking gun
- (2) tubes silicone caulking
- Drill bits: 1/8", 3/8", 7/16", 1/4"
- Allen wrenches: 4mm
- Open-end wrenches: 19mm, 17mm
- Keyhole saw

A. UNPACKING

1. Before starting any of the installation procedures unpack the awning and inspect the product for any possible damage that may have occurred during shipping.
2. Before starting any of the installation procedures ensure that the length, fabric, and motor placement of your awning are correct.
3. When you have determined that the product is to your satisfaction, remove the mounting brackets and place the awning in a safe location while preparing the RV.
 - a. To remove the brackets locate the slide lock that retains the bracket to the housing. (Figure 1)
 - b. Using a 4mm Allen wrench, loosen the set screws on the slide locks.
 - c. Once the set screws have been loosened the slide locks should slide freely, clear the slide lock away from the bracket.
 - d. You should now be able to remove the bracket.
4. If you have discovered any damage or missing parts please contact your supplier.



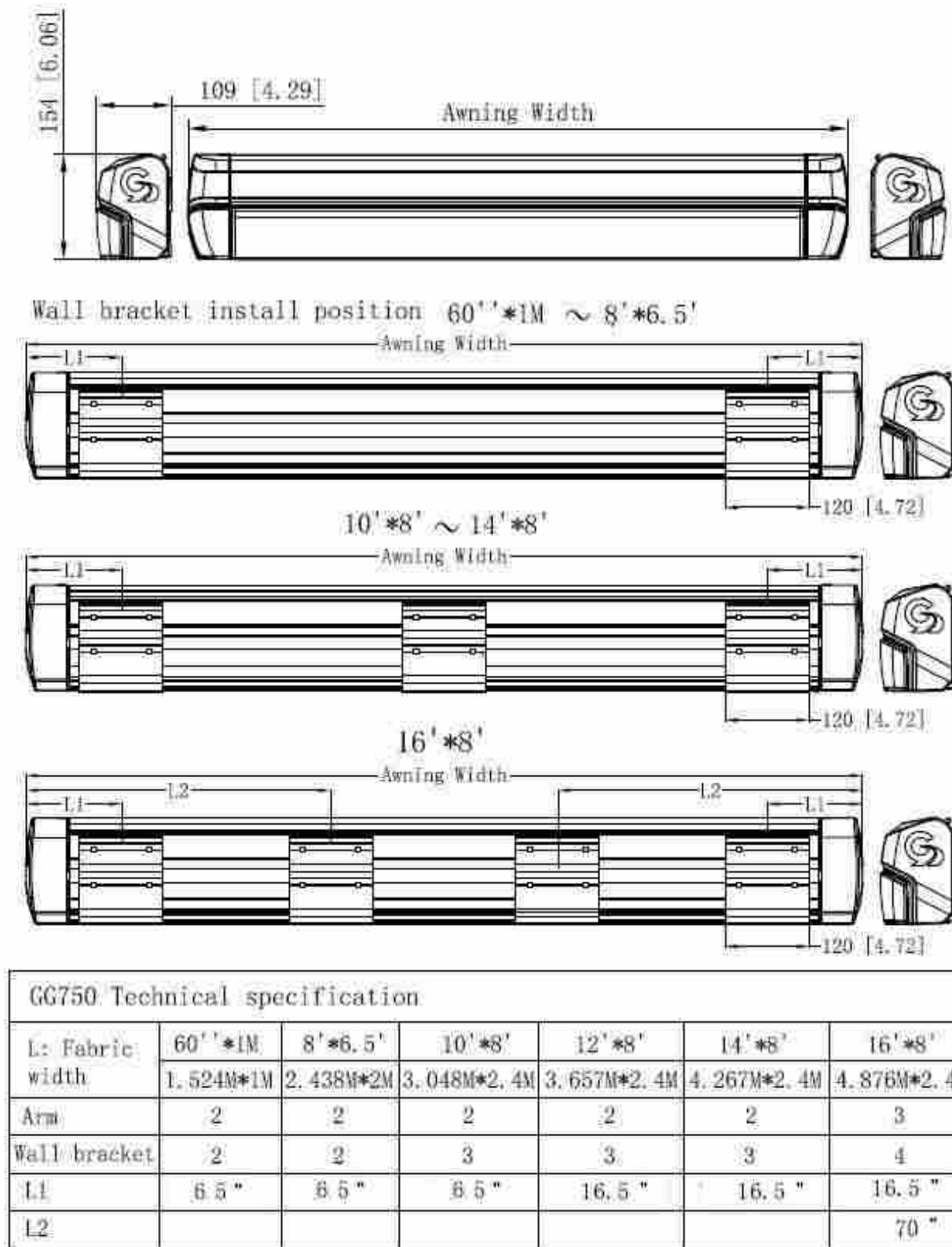
(Figure 1)



B. LAYOUT AND MOUNTING THE BRACKETS

1. **SIDEWALL APPLICATION, AWNING BRACKET – NOTE: Please take into consideration all possible clearances, and obstacles before installing this awning. Items such as slide rooms, etc. vary from one manufacturer to another. Please consult Girard Systems if there are any questions regarding your installation.**
 - a. The mounting brackets can accommodate 1/4" lag bolts for mounting.
 - b. Determine the location for the final installation position of the awning, including height to be installed.
 - c. Mounting brackets must be installed at the locations shown in bracket placement diagram (see Figure 2).

NOTE: When installing a three arm awning, make sure one of the applicable center brackets is directly behind the shoulder of the middle arm.



(Figure 2)



Failure to follow these instructions will void the warranty of this product.

- e. Now that you have determined the bracket locations, using the bracket as your template, mark the holes for fastening the bracket. **NOTE: Use chalk line to make absolute sure brackets are mounted in straight line.**
- f. Using a 1/8" bit, pilot drill the centers of the marked holes. Inside of the RV verify the locations of the backing plates. **Note: Please consult your RV's wiring diagram to ensure that no wiring will be damaged while drilling the hole.**
- g. Pre-drill four 1/4 inch holes per mounting bracket through the pilot holes.
- h. Apply a liberal amount of silicone caulking around each hole before installing the brackets.
- i. Install the 2 outer brackets, and then the middle bracket(s) (if required) with four 1/4 x 1 1/2" carriage bolts, washers, lock nuts and backing plate per bracket. (Figure 2)
- j. Tighten bolts and then apply silicone caulking to the top edge and both sides of each bracket.
- k. For the motorized option, on the motor side of the awning drill a 7/16 inch hole for the awning motor power cable to enter the RV near the electrical source. Position the hole 4" inch from end of awning. Do not drill hole higher or lower than the bracket. This will ensure that it will not be seen after the awning is installed.

3. SIDEWALL APPLICATION, AWNING RAIL MOUNTING

- a. Determine the location for the final installation position of the awning, including height to be installed.
- b. Cut the awning rail to 6" less than the awning length.
- c. Position the awning rail on the mounting location, making sure it is level.
- d. To attach the awning to the awning rail, angle it at 90 degrees and then insert the corresponding track on the awning into the awning rail (Figure 3).
- e. Once the awning rail is inserted, rotate the awning down so it is flush with the mounting surface and resting against it.
- f. Open the awning to allow access to the inside of the main housing.



g. ON AWNINGS 13' AND UNDER:

Drill through the back of the awning case (Figure 3) in 3 positions, one in the middle of the awning, and one within 10" or less of each awning arm shoulder (2 shoulders). Seal holes with applicable sealant and install lag screws and washers to secure the housing to the wall.

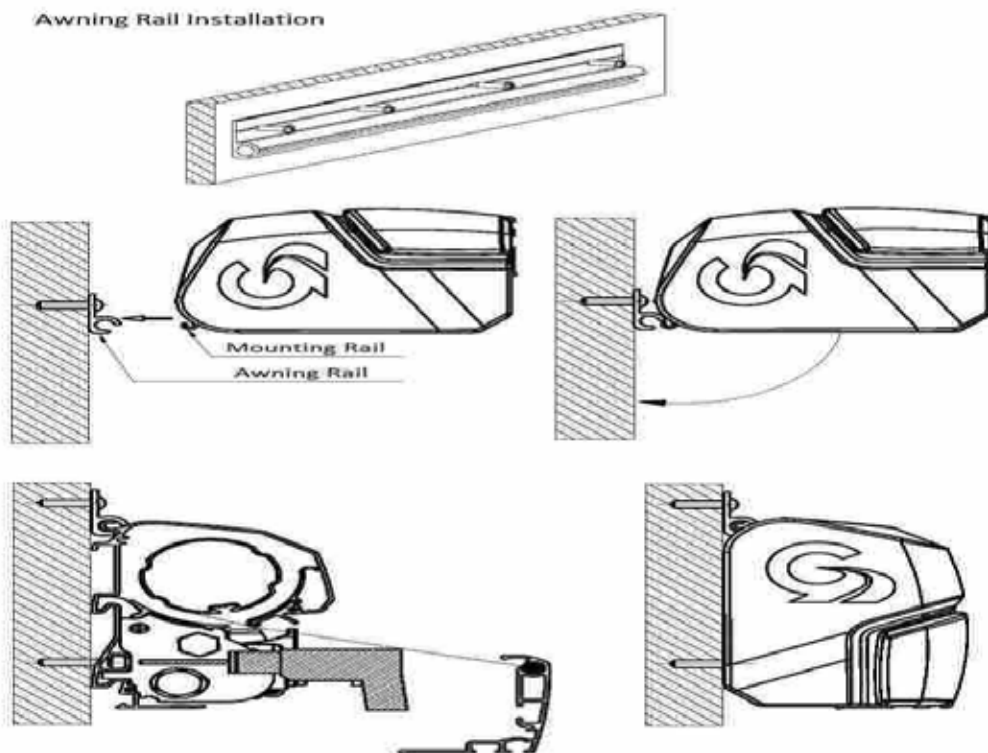
h. ON AWNINGS OVER 13' :

If two arm awning, drill through the back of the awning case (Figure 3) in 4 positions, two equally spaced between the awning arm shoulders, and one within 10" or less of each awning arm shoulder (two shoulders). Seal holes with applicable sealant and install lag screws and washers to secure the housing to the wall.

If three arm awning, drill through the back of the awning case (Figure 3) in 4 positions, one equally spaced between the right hand and left hand arm shoulders and one within 10" or less of each awning arm shoulder (three shoulders). Seal holes with applicable sealant and install lag screws and washers to secure the housing to the wall.

NOTE: Support must be placed behind the lag positions to ensure adequate structure for attaching hardware. At a minimum a wood backer of 3/4" thickness or 1/4" aluminum plating is recommended.

NOTE: Take care not to drill through awning wiring when attaching awning housing to wall.

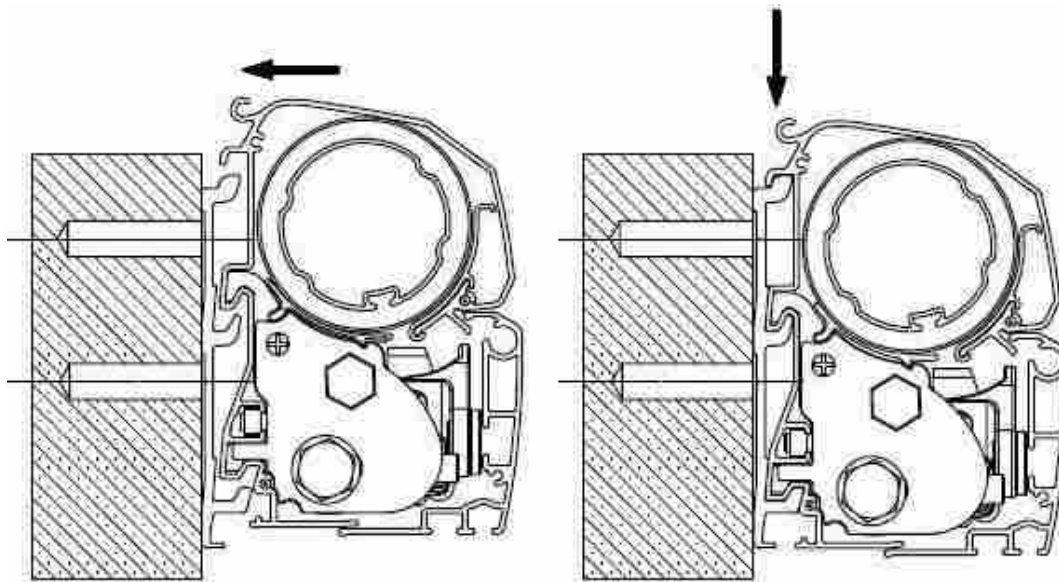


(Figure 3)



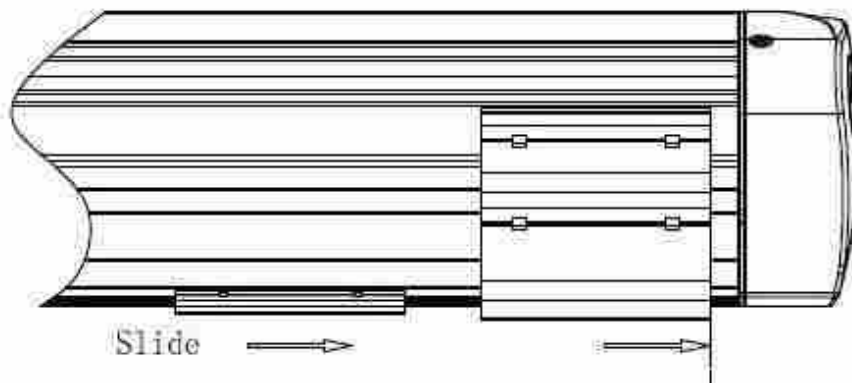
C. MOUNTING THE AWNING.

1. Lift the awning into position for fastening to the vehicle mounted brackets.
 - a. Ladders are usually sufficient; however, a scaffold or forklift may be used.
 - b. If using a forklift use all necessary caution to protect the surface of the awning. Lift from the center of the awning to maintain product balance while elevating.
2. Place the awning onto the brackets while feeding the motor power cable through the hole. A small amount of lubricant may aid the feeding of the cable. Make sure the grooves of the awning are securely engaged into the channels on the bracket. (Figure 4)



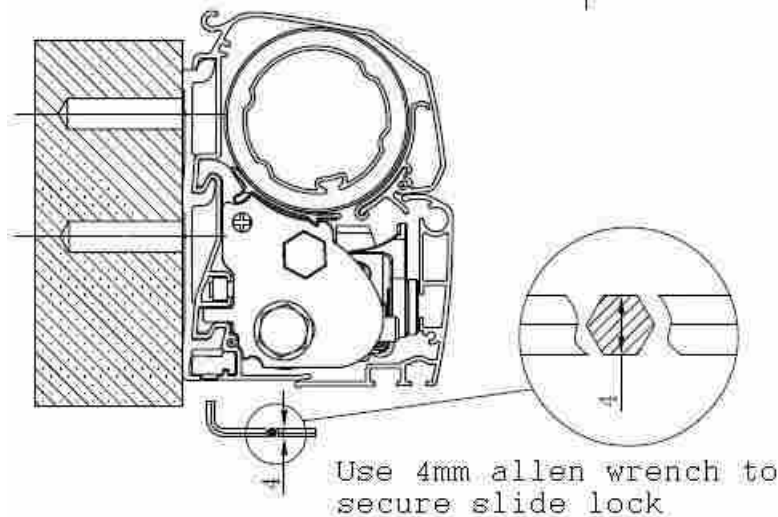
(Figure 4)

3. Secure the awning by moving the slide locks along the bottom awning track until they are located under their respective brackets (Figure 5). The final position of the slide lock should be directly under the shoulder of the arm.



(Figure 5)

4. Once the final location of the slide locks has been achieved, tighten both set screws on each slide lock with a 4mm Allen wrench (Figure 6). This secures the awning in place.



(Figure 6)

(OPTIONAL, WEATHER STRIPPING NOT INCLUDED, SIDEWALL APPLICATION ONLY)

1. Trim weather stripping to the length of the awning and remove any overhang.
2. Make a small cut in the weather stripping to allow for the motor cord.
3. Apply generous beads of silicone along the weather stripping.
4. Push weather stripping firmly into place.
5. Wipe off excess silicone.



Improper operation of the handle of a manual awning may result in damage to the fabric. Please read and observe the following warning.

WARNING

When turning the manual handle to extend the awning make sure you do not extend beyond the point where the fabric loses tension and lays on the arms.

If this were to accidentally occur, immediately turn the handle in the opposite direction to retract the awning to the maximum extension and reestablish proper tension of the fabric.

Rotating the handle beyond the maximum extension will result in the fabric wrapping on the tube in the wrong direction and will damage the fabric and may result in the awning getting stuck in the extended position.

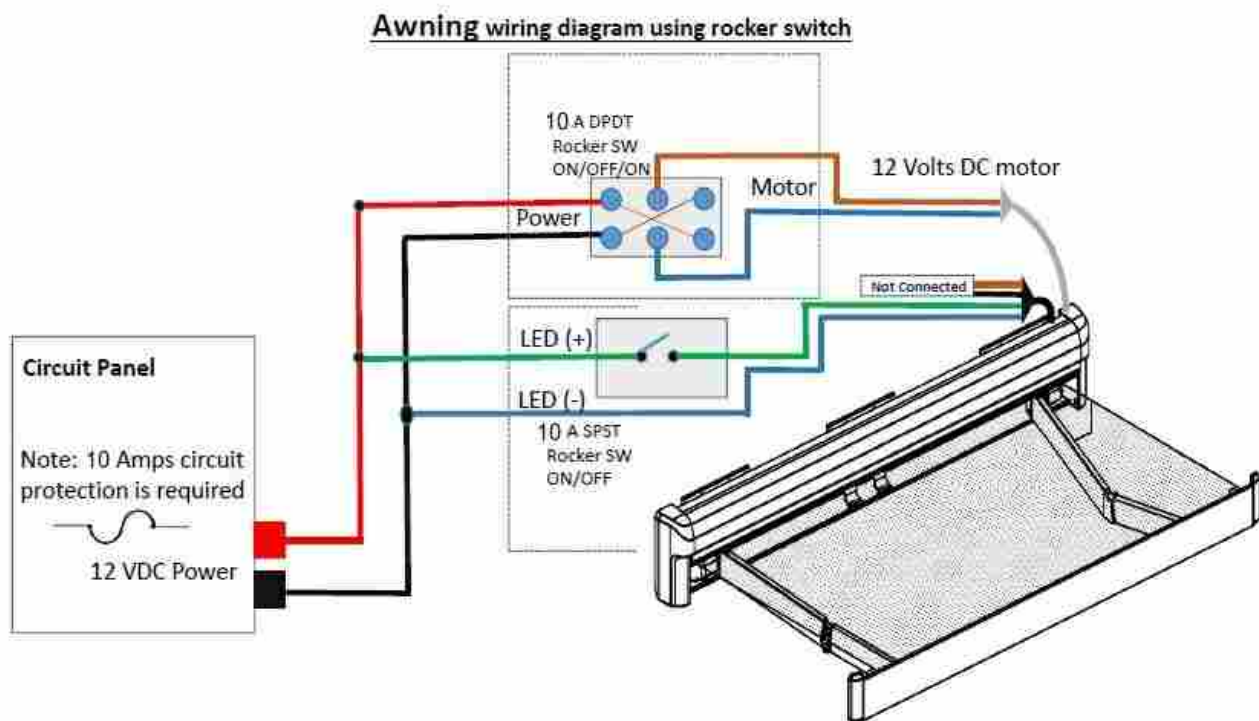
Please note the label on the handle above the grip points to indicate the proper extend (OUT) and retract (IN) directions of rotation.



D. ELECTRONIC CONTROLS INSTALLATION

A. Rocker Switch Wiring

The rocker switch is wired according to Figure 8.

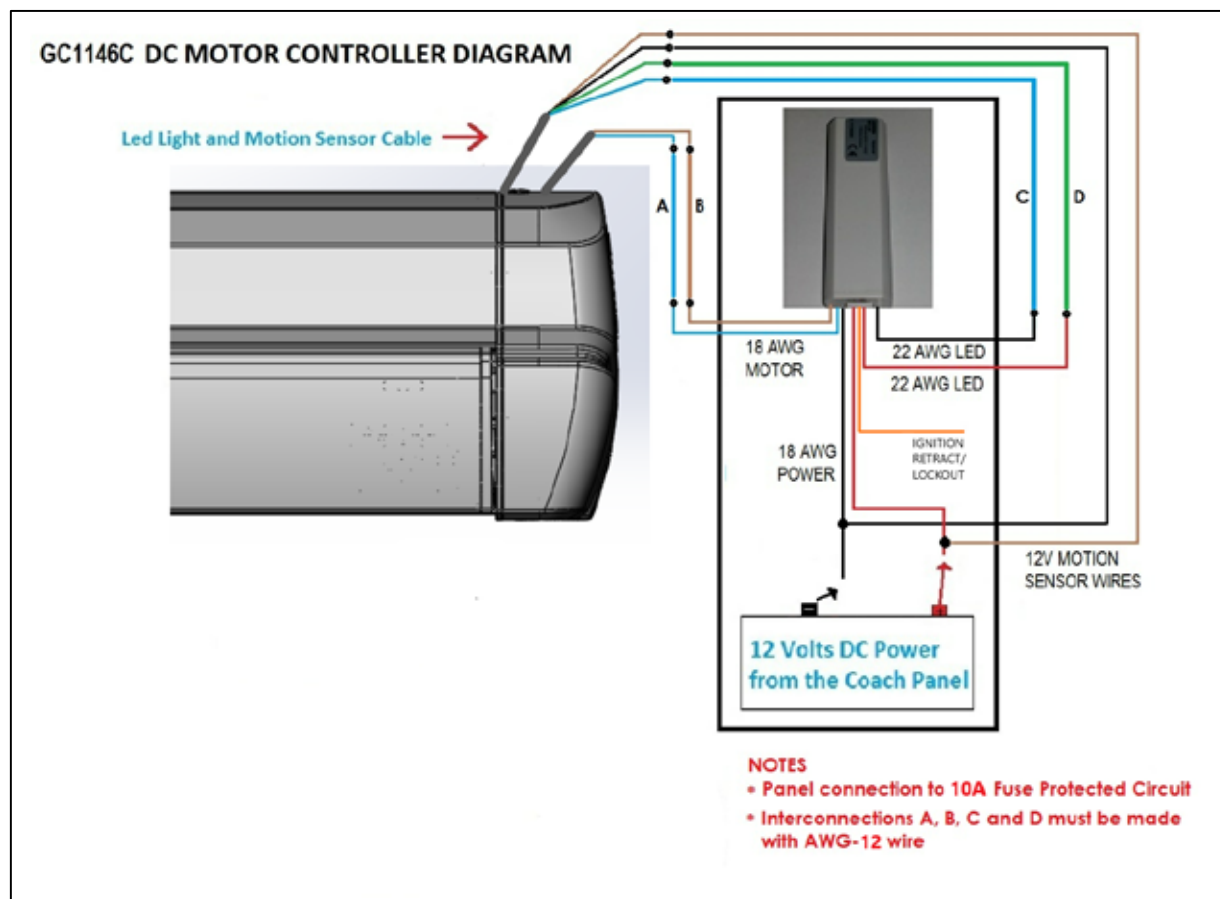


(Figure 8)



B. GC1146C DC Motor Controller Wiring

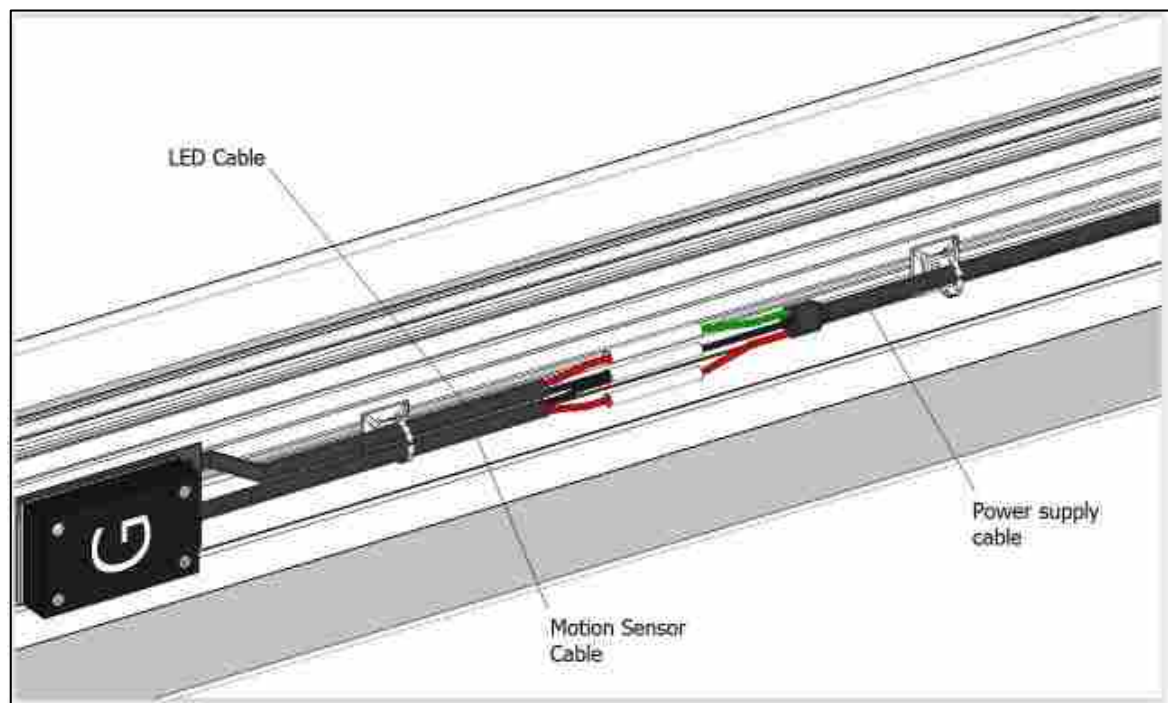
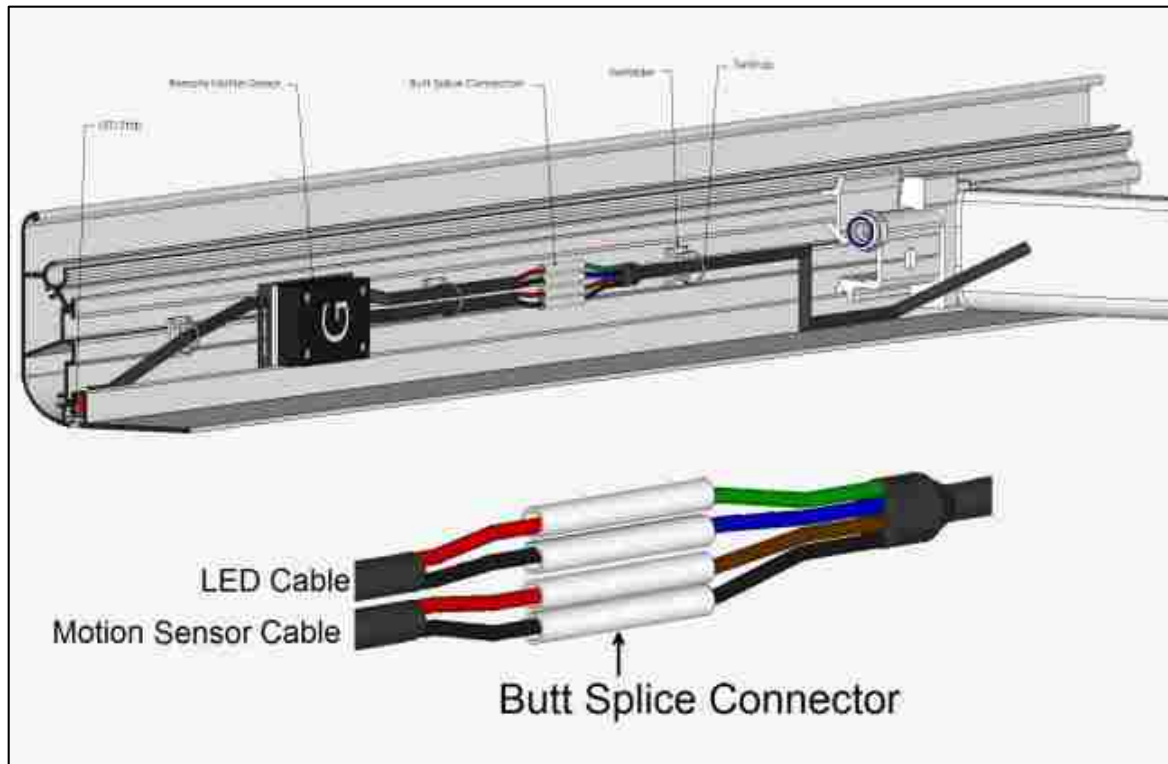
Wiring Diagram



NOTE: The larger (18) gauge red/black wire coming out of the control box is the incoming power. The smaller (22) gauge red/black wire is the LED outgoing power.



C. Motion Sensor (98GC779G) and LED Connections



4 conductor power supply



Programming the Motion Sensor (98GC779G)

Preparation for Pairing

NOTE: All electronic kits shipped from the factory are preprogrammed and do not require programming. This section is intended for reprogramming if required.

Remove the 2 small Phillips screws which secure the motion sensor to the awning.



Fig.1

Then turn it over.



Fig.2



Remove the 4 Phillips screws holding the module together. Remove the base plate and silicone insert.



Fig.3

Turn the base plate over (Magnet down). Then place the motion sensor on top of it so that the magnet is aligned with the reed switch.

This is required to allow re-programming

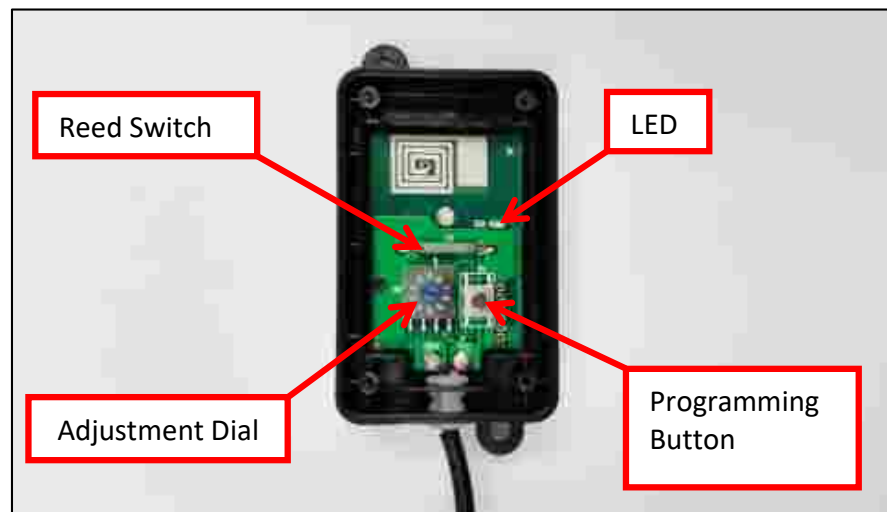


Fig.4



Note; when carrying out this part of the procedure each step must be executed within 6 seconds of the previous one or the module will revert to factory settings. It is highly recommended that you read and understand the following sequence before attempting to execute it.

- 1) Set the Motion Sensor Adjustment Dial to 0. (See Fig.4).
- 2) Connect the GC779G Motion sensor to a 12volt DC circuit. At this point the Purple LED will illuminate and then begin to blink. If it does not, the unit is not receiving the correct power. Ensure that the magnet and reed switch are aligned and verify the electrical connection before proceeding.
- 3) Using an appropriate tool, press the P2 Button on the back of the Remote Controller TWICE. The GC1146C will beep ONCE with each press.
- 4) Press the programming button on the GC779G Motion sensor ONCE (See Fig.4). The GC1146C will beep several times to indicate that the program has been accepted.
- 5) Ensure that the code was accepted by pressing the Program button on the GC779G Motion sensor again. The Awning should make a small step IN or OUT. Or shake the motion sensor and the Awning will fully retract.
- 6) If the Awning does not retract, repeat steps a. to d.
- 7) Set the Adjustment Dial to the desired sensitivity level 1 to 5. **Never set higher than 5.** (The factory setting is 3).

Once programming is complete, reassemble the Motion sensor module and mount it on the awning lead rail.



Wired Motion Sensor

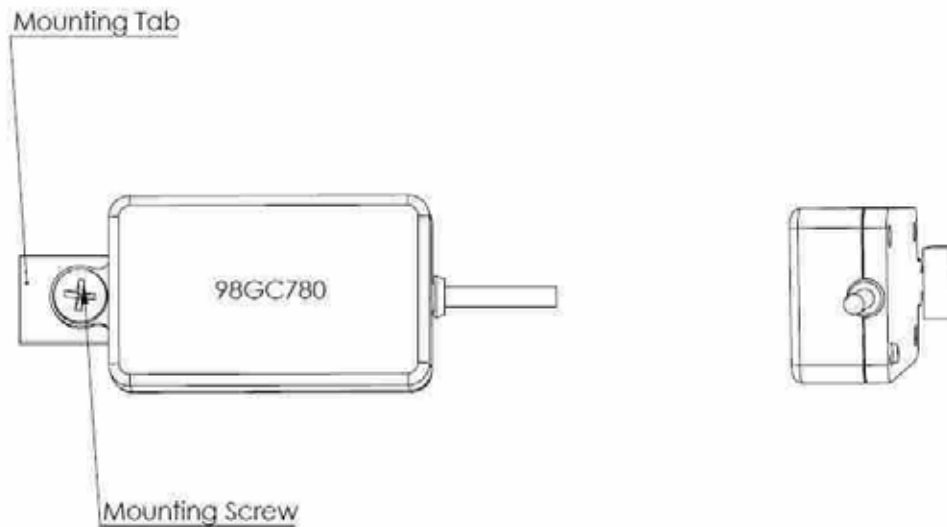


Fig. 3

This wired motion sensor communicates directly to the DC motor Controller 98GC781(B), (W) by RS485 Protocol.

Attach the motion sensor to the lead rail using the mounting tab, see figure 3 above.



Motion Sensor Installation view:

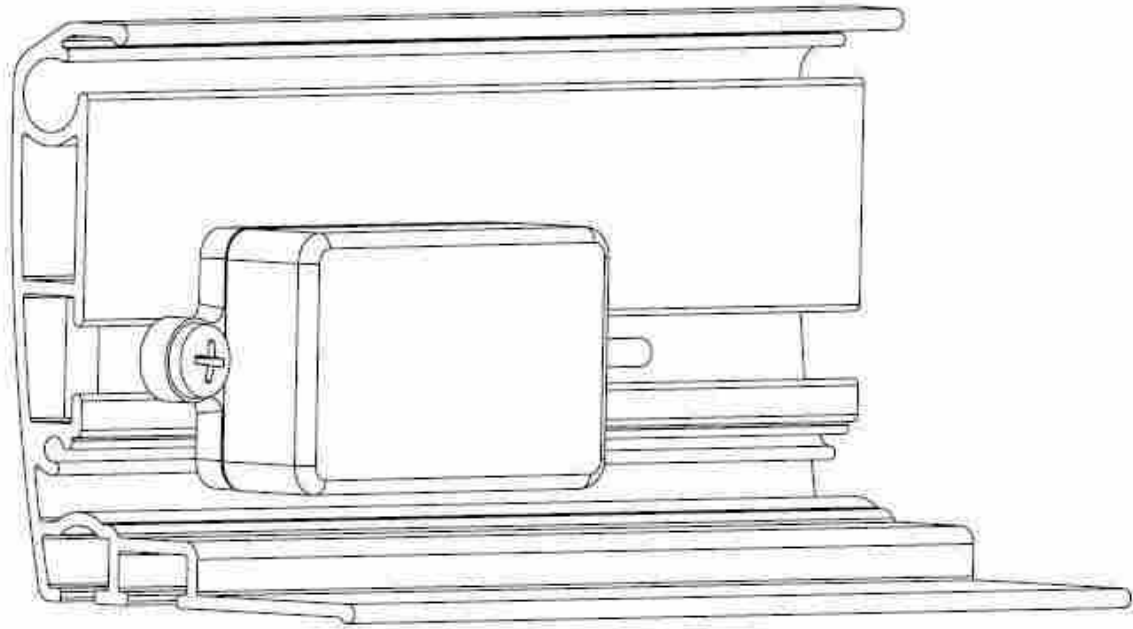


Fig. 4

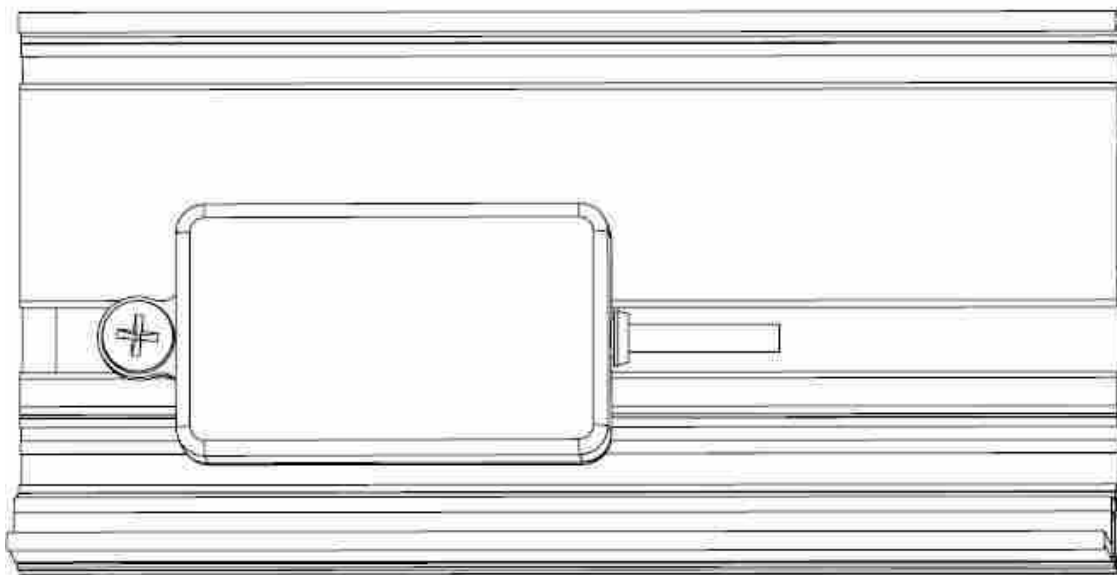


Fig. 5



E. Wiring Diagram:

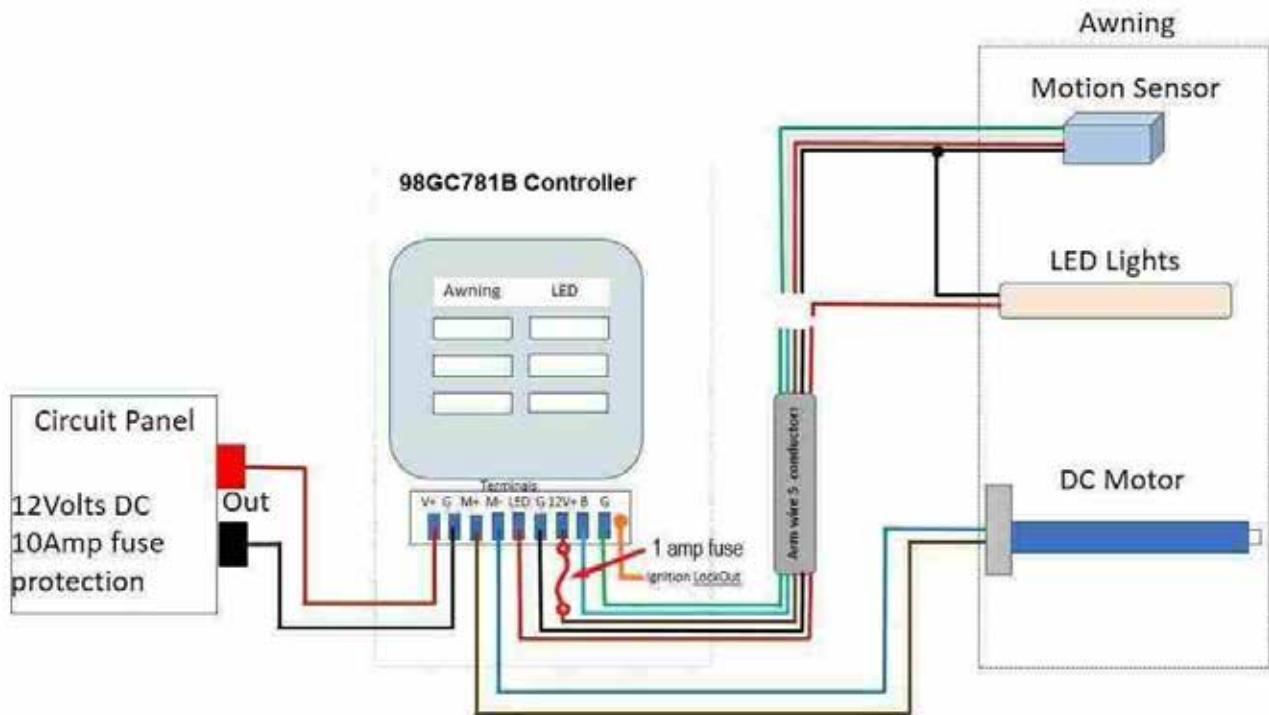


Fig. 6



TESTING AND ADJUSTMENTS

OVERVIEW

- A. Adjusting Motor-limit switches
- B. Manual Override
- C. Adjusting Pitch and Elbow height
- D. Motion Sensor Testing

A. ADJUSTING MOTOR LIMIT SWITCHES

TOOLS REQUIRED

Black plastic key provided with awning, or 4mm (5/32") Allen wrench.

NOTE: The motor limit switches have been adjusted to the correct positions at the factory prior to shipment. When fully retracted the awning motor is set to stop the exact moment the awning box closes. When fully extended the fabric should be taut and the arms should be slightly bent, exposing a gap of about 1/4" at the elbows.

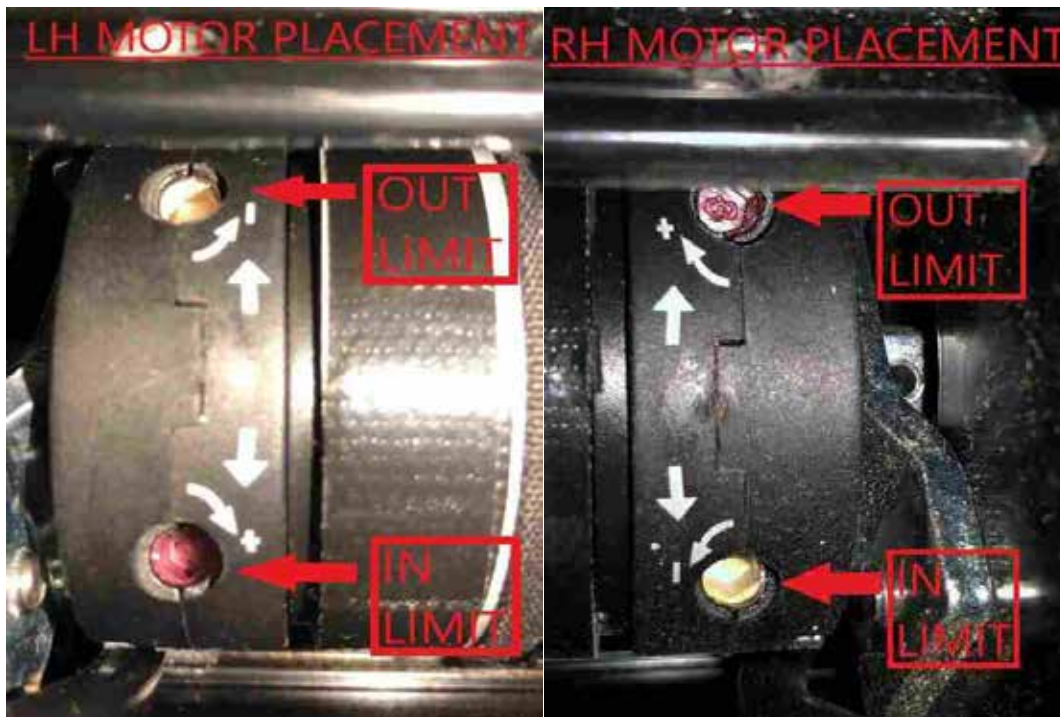
Always check the motor limits after installation to ensure that the awning opens and closes correctly. Awning fabric can stretch over time, this will require an adjustment of the IN and/or OUT limit switch.

IMPORTANT: EXTREME CARE SHOULD BE TAKEN TO ENSURE THAT THE MOTOR LIMIT TURNS OFF AT THE EXACT MOMENT THE AWNING BOX CLOSSES. FAILURE TO DO SO WILL CAUSE THE MOTOR TO RUN WHEN THE AWNING IS CLOSED. THIS WILL DESTROY THE MOTOR.

1. The motors used in Girard Systems awnings are reversible.
2. The motor has limit settings for both OUT (extension) and IN (retraction).



3. The limit switches can be adjusted by use of the black key provided with the awning, or you may use a 4mm (5/32") Allen wrench.
4. Extend the awning a few feet to gain access to the motor. Locate the motor. The limit adjustment screws are located on the head of the motor. Using the symbols printed next to the adjustment screws, turn the black key (or 4mm Allen wrench) to make the necessary adjustments. The motors are labeled with a + or a – to indicate the adjustment direction.

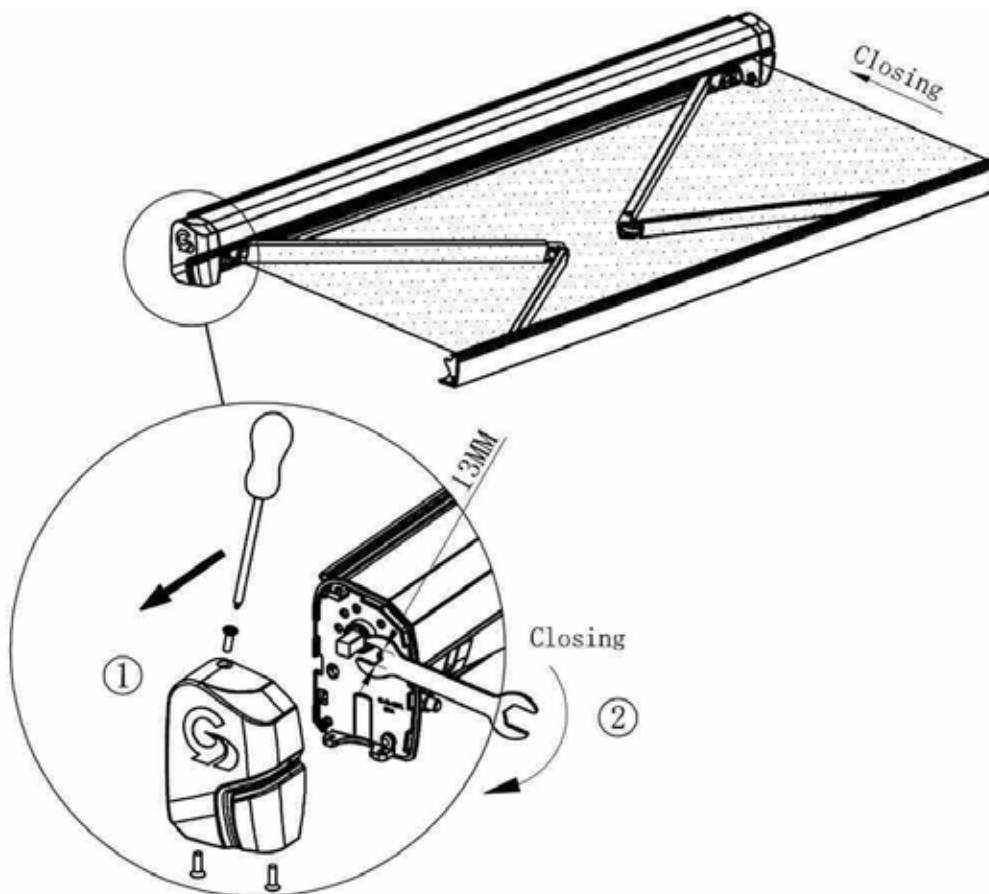


5. Approximately 1/4 turn of the adjustment screw represents about 1" of awning movement. NEVER set outward limits so that the fabric is slack with full arm extension. For proper adjustment set limit switch to stop the motor just before the arms lock. This will expose about a 1/4" gap at the elbow.



B. MANUAL OVERRIDE

1. In case of motor issues, the GG750 has a manual override to close the awning.
2. Remove the endcap opposite the motor, by removing the 3 Philips head screws.
3. Using a 13mm wrench, turn the manual override shaft in order to close the awning, see Figure 10. NOTE: The manual override is one-way, it can only close the awning.
4. Figure 10 is showing a right hand motor version of the GG750. If you have a left hand version, the manual override will be on the opposite side.



(Figure 10)



C. ADJUSTING PITCH and ELBOW HEIGHT

NOTE: Adjustment of the Elbow height and pitch, will affect the height of the awning lead rail when it is fully deployed.

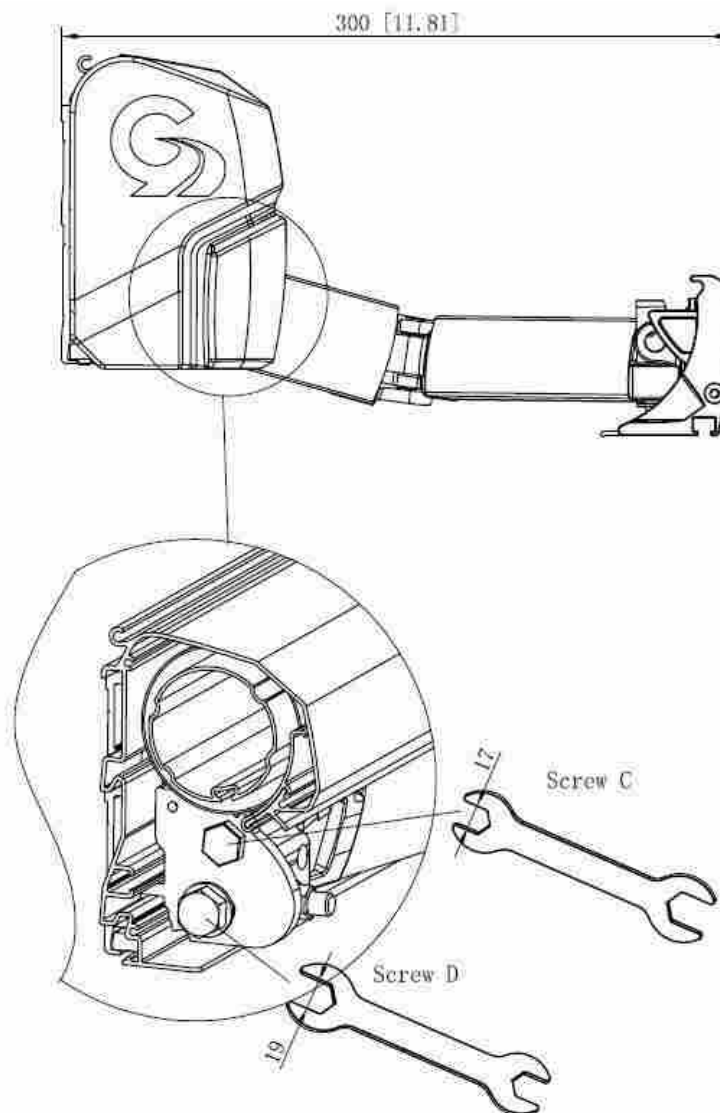
This adjustment is usually required after an arm replacement. Also, if the elbow of the arm hits the bottom of the casing as the lead rail closes.

Tools Required

- 17mm open-end wrench
- 19mm (3/4") open-end wrench
- 4mm Allen wrench

1. ELBOW HEIGHT

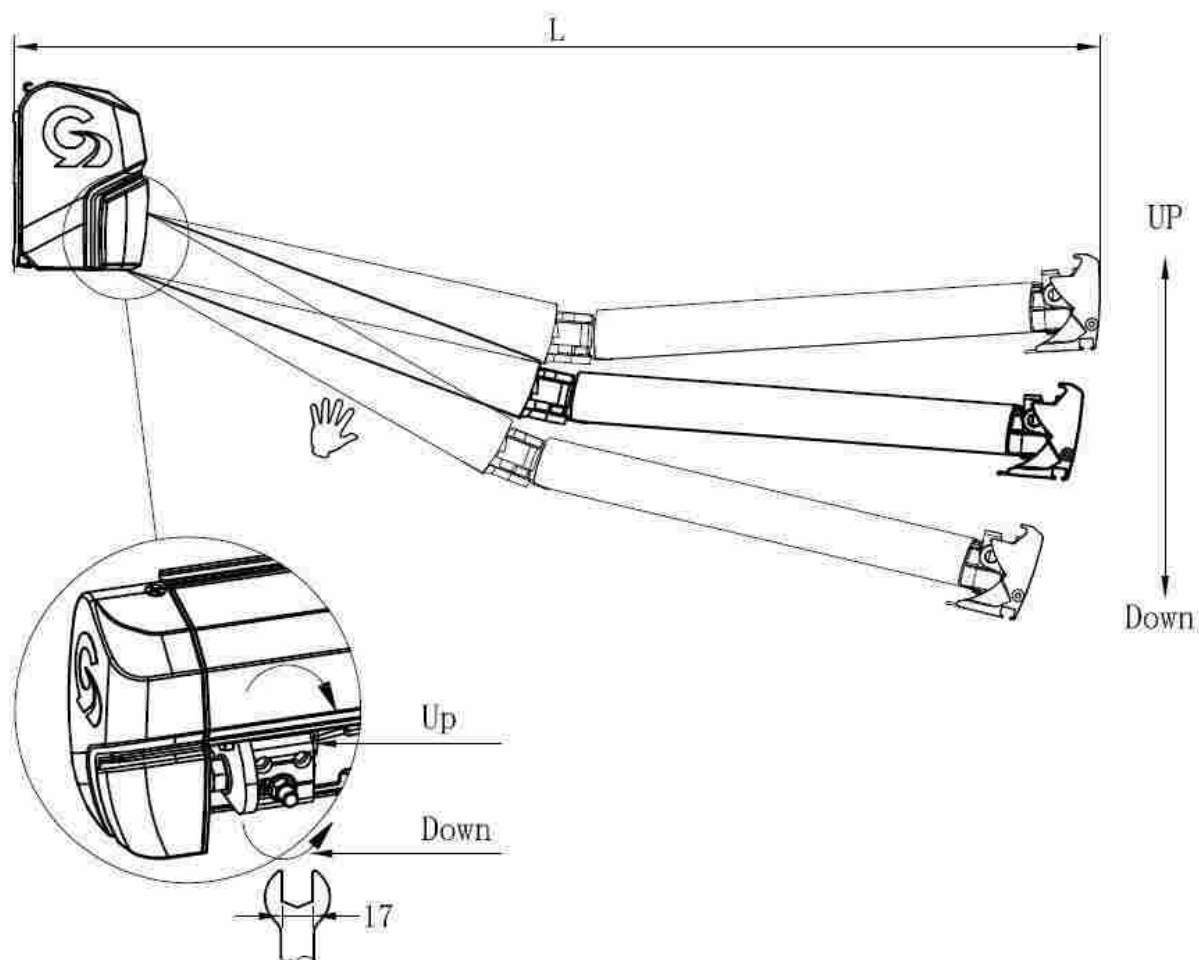
- a. Extend the awning approximately 12"
- b. To lower the elbow: Locate screw C located on the side of the shoulder, the top bolt. (Figure 11) Using a 17mm open-end wrench, rotate the bolt counter-clockwise to lower the arm position. Then use a 19mm wrench to tighten Screw D, the bottom bolt.
- c. To raise the elbow: Locate screw C located on the side of the shoulder, the top bolt. (Figure 11) Using a 17mm open-end wrench, rotate the bolt clockwise to raise the arm position. Then use a 19mm wrench to loosen Screw D, the bottom bolt.
- d. Close the awning completely to ensure smooth operation, that the lead rail lies flush and square along the length of the cassette, and that the arms fold inside the cassette without interference.



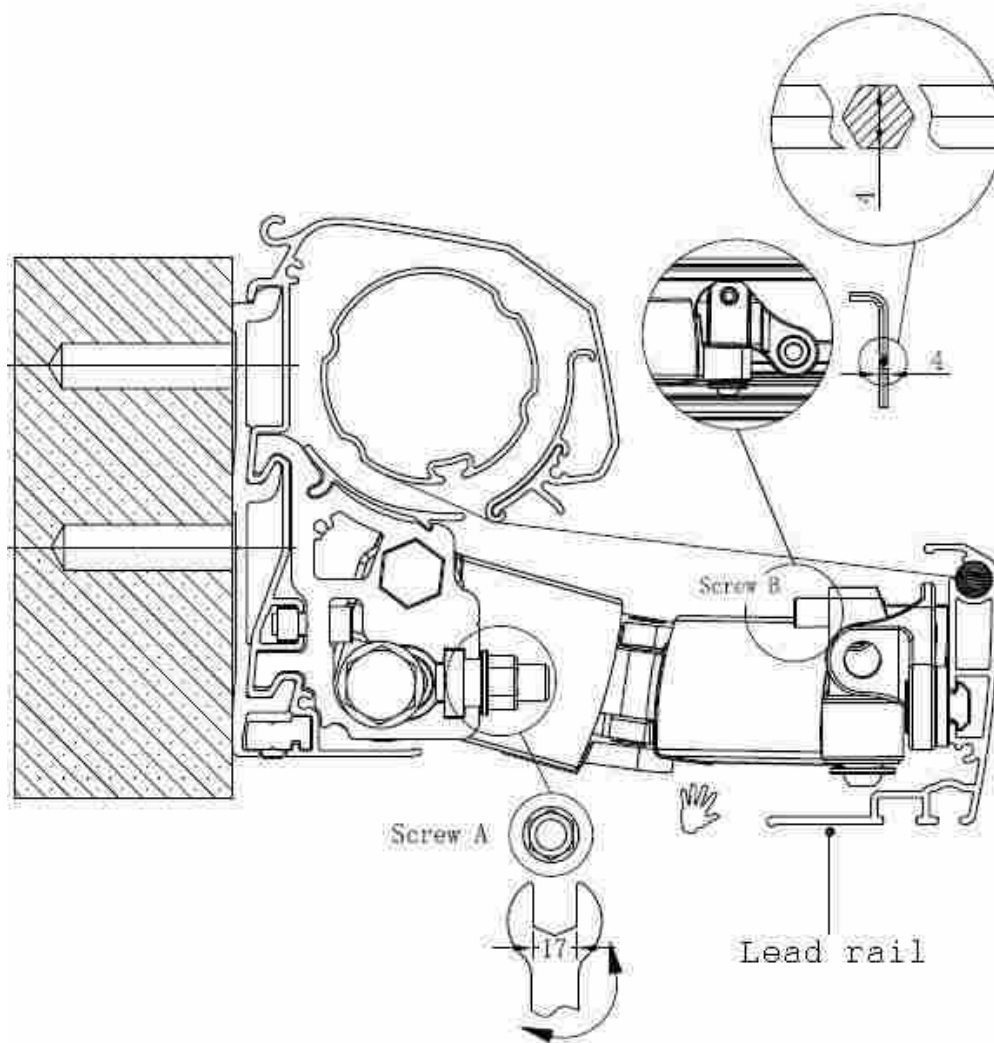
(Figure 11)

2. **ADJUSTING PITCH**

- Extend the awning to its fully extended length.
- Locate screw A, adjustment nut located on front side of the shoulder assembly (Figure 12, 13). Using a 17mm wrench rotate the nut **counter-clockwise** to **lower** the pitch or **clockwise** to **raise** the pitch.
DO NOT OVERTIGHTEN AS THIS WILL RESULT IN DAMAGE TO THE AWNING. LIFTING UP ON THE ARM SLIGHTLY TO RELIEVE PRESSURE MAY BE NECESSARY.
- Close the awning completely to ensure smooth operation and that the lead rail lies flush and square along the length of the cassette.



(Figure 12)



(Figure 13)

D. TESTING THE MOTION SENSOR (Wind Sensor)

1. Partially extend the awning (at least 3 feet).
2. Physically activate the motion sensor by shaking the awning lead rail.
3. At this point the awning should retract; if not, check that there is a 12VDC supply to the motion sensor and that the motion sensor is correctly programmed.

NOTE: The Motion sensor will send a retract signal to the motor of the awning it is programmed to on the RV. If there are multiple awnings extended that begin to retract



simultaneously under windy conditions, the power system of the vehicle must be able to withstand the resulting surge of current. The surge will be the greatest when the awnings are fully extended. When testing the system verify all of the awnings will close when fully extended.

E. ADJUSTING THE LEAD RAIL

The lead rail on your awning has been preset at +/- 3 degrees. This allows the lead rail to rest firmly into the cassette and also creates a weather resistant seal for travel. To increase or decrease the pitch angle insert a 4mm Allen wrench into the Pitch adjustment screw, screw B (Figure 13). Turn clockwise to increase the pitch and turn counterclockwise to decrease the pitch. Ensure that the pitch adjustment screw is set evenly on all of the arms.

TROUBLESHOOTING GUIDE

PROBLEM:

The lead rail is binding on the side of the awning casing; i.e. the rail is offset from housing.

SOLUTION:

- Open the awning about 3 feet.
- Loosen the lead rail horizontal adjustment screws on all arms (Figure 14).
- Locate and remove the two fabric set screws that are on each end of the lead rail (Figure 14). The lead rail is now ready to be shifted.
- Retract the awning until the lead rail is about 4 inches from the fully closed position.
- Using a rubber mallet, tap the end of the lead rail to move it into the correct position.
- When proper alignment has been achieved tighten the lead rail horizontal adjustment screws (Figure 14), and then replace the fabric screws (Figure 15).



(FIGURE 14)



(FIGURE 15)

PROBLEM:

The motor side of the awning closes when the awning is retracted but the opposite end does not.

SOLUTION:

Refer to "Adjusting the Lead Rail" on page 37. If this does not solve the issue please call the Girard Systems service line at (949)259-4000 or toll free at (800)382-8442.



PROBLEM:

Motor will not operate.

SOLUTION:

- Check that the panel fuse on the 12VDC circuit is good
- If your vehicle has an Awnings Power Main Switch, locate that switch and make sure it is in the ON position.
- If this does not solve the issue please call the Girard Systems service line at (949)259-4000 or toll free at (800)382-8442.

PROBLEM:

The motor will operate for 10-12" and then stop.

SOLUTION:

The motor may not be receiving enough power to operate correctly.

- Check to ensure that you have a minimum of 12VDC at the motor connection, if not switch on your generator or connect to shore power.
- If this does not solve the issue please call the Girard Systems service line at (949)259-4000 or toll free at (800)382-8442.

PROBLEM:

The fabric is loose when the awning is fully extended; i.e. the roller keeps turning after the awning arms have locked open.

SOLUTION:

The motor's OUT limits must be reset to factory standards. Please refer to the "Adjusting the Motors Limit Switches" section on page 30-31.

PROBLEM:

The motor stops before the lead rail has closed completely into the awning cassette on either or both sides. There is no apparent binding of the awning components.

SOLUTION:

The GG750 Awning is equipped with a manual override motor which has manual limit settings. The IN limit may need to be adjusted to allow the box to be closed tighter. Refer to the "Adjusting the Motors Limit Switches" section on page 30-31.

**PROBLEM:**

As the awning is closing, the elbow of one or more of the arms is hanging down preventing the case from closing.

SOLUTION:

Please refer to the "Adjusting Pitch and Arm (Elbow) Height on page 34-35.

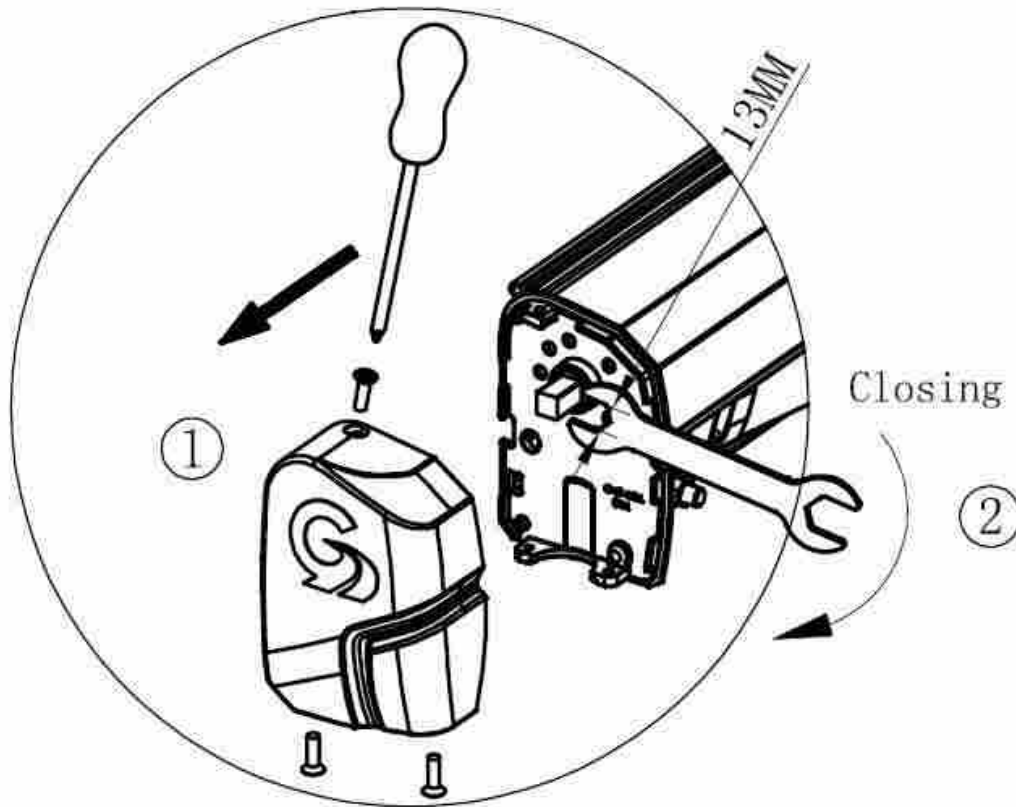
COMMON REPAIR PROCEDURES

MOTOR REPLACEMENT

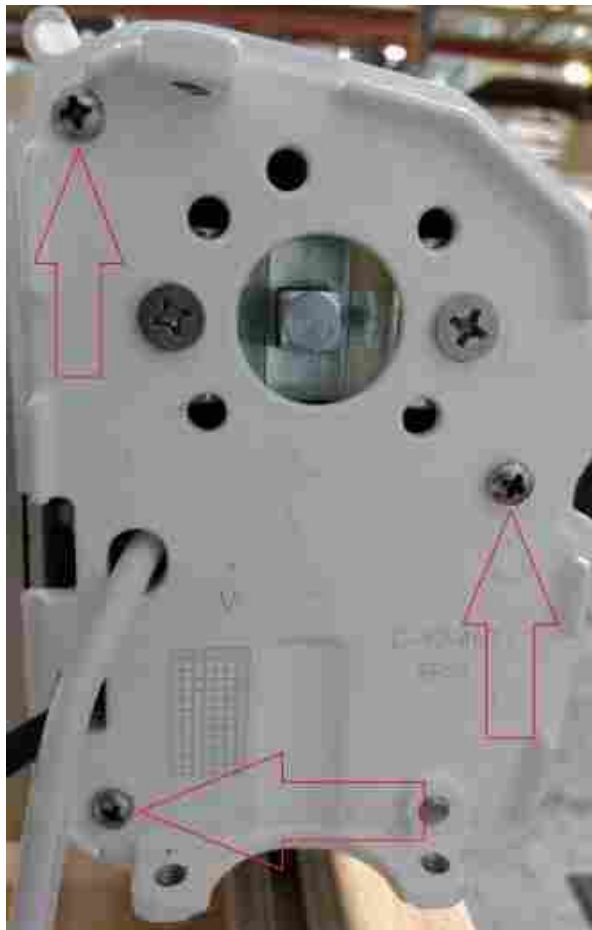
NOTE: Replacement procedures vary due to motor styles, placement, factory installation methods, and preferences of different vehicle manufacturers. These variations primarily effect how the motors are accessed; replacement operations are generally the same for any situation.

A. REMOVING THE OLD MOTOR

- 1.** Use tie straps on either side of the awning to secure the lead rail of the awning to the cassette. The strap will slide in between the awning and coach wall on each end. Take care to leave slack in the straps so when the motor side endplate is removed the lead rail will open approximately 2" to take pressure off the awning.
- 2.** Identify which side the motor is located on. Proceed to take off the motor side endcap by removing the three #3 Philips screws, there are two located on the bottom and one on top. Please take note that some RV manufacturers have requested the endcap top screw to be left out due to clearance issues with slide toppers.
- 3.** Proceed to take off the motor endplate. (Figure 17) Take caution when taking the last screw out of the plate and when removing the plate as it will be under pressure until it is separated from the motor. Upon removal of the plate the lead rail of the awning will open into the straps freeing the pressure from the motor.
- 4.** Confirm that there is no power heading to motor, cut motor wire close to motor leaving a small amount for warranty testing. Grip motor by the head and pull out of tube making sure to hold the roller tube to keep it in position on other end of awning.



(Figure 16)





B. INSTALLING THE NEW MOTOR

- 1.** With the new motor in hand, align the notch in the drive (at the far end of the motor) with the indentation in the awning roller tube. Slide the motor all the way in. Turn the motor until its inner notch also lines up with its indentation on the tube.
- 2.** Feed motor cable completely through the hole in the motor plate.
- 3.** Make sure the awning roller tube is still seated and connected into the roller tube support bracket at the opposite end of the awning.
- 4.** Rotate the motor and roller tube assembly until the motor wire is positioned towards the top of the awning.
- 5.** Reinstall the motor plate, lining the square motor peg up with the corresponding slot. Reinstall the 3 screws securing the motor plate (Figure 17).
- 6.** Cut and strip the motor wires preparing for heat shrink butt connection, slide a piece of heat shrink onto one end of the wires.
- 7.** Connect the new motor wires with heat shrink butt connectors and heat shrink.
- 8.** Test for the proper function of the new motor by using the Remote Control or the wall switch. NOTE: The motor limits are not adjusted yet, take care to only test motor to make sure it is moving in each direction a small amount to confirm.
- 9.** After the motor has been replaced, the motors' limit switches must be adjusted. Please refer to the "ADJUSTING MOTOR LIMIT SWITCHES" section of this manual.
- 10.** Replace motor side awning endcap with applicable screws.



FABRIC REPLACEMENT

A. FABRIC REPLACEMENT PROCEDURE

This procedure involves removal of the awning motor and roller tube to attach the replacement fabric to the existing tube.

NOTE: FOR PERSONAL SAFETY, AND BEST RESULTS IT IS RECOMMENDED THAT TWO TECHNICIANS PERFORM THIS FUNCTION.

B. REMOVING THE OLD FABRIC

1. Partially extend the awning approximately two feet, tie strap each side of lead rail to case to prepare for motor and tube removal. Open awning a few more inches until fabric is slack and pressure is off of fabric/motor.
2. Identify which side the motor is located on. Proceed to take off the motor side endcap by removing the three #3 Philips screws, there are two located on the bottom and one on top. Please take note that some RV manufacturers have requested the endcap top screw to be left out due to clearance issues with slide toppers.
3. Proceed to take off the motor endplate. (#2 Philips, Figure 17) Take note that there will be no pressure on the endplate as long as the fabric is slack and the lead rail is being held by the tie straps.
4. Confirm that there is no power heading to motor, cut motor wire in the middle of wire leaving enough room for reconnection on either side of wire. Leave Motor in end of tube as it will not need to be removed for roller tube removal.
5. Visually identify the white bushing on the non motor side where the roller tube is connected. You will need to make sure upon removal of the tube that this bushing stays installed on the non motor side endplate and doesn't get lost.
6. Take off both lead rail endcaps and remove fabrics screws on either side of lead rail. (Figure 18)
7. The roller tube and fabric are now ready to be removed, take caution and remove tube from housing while sliding the lead rail end of the fabric out of the channel on lead rail, make sure that the motor does not fall out of tube.



(Figure 18)



C. INSTALLING THE NEW FABRIC

IMPORTANT: REPLACEMENT FABRICS ARE ROLLED AND FOLDED FOR SHIPMENT. THE SEAMS MUST FACE DOWNWARDS AS THE FABRIC IS INSTALLED. THERE IS A SMALL WHITE POLY (POLYESTER) ROPE INSERTED IN THE FABRIC THAT WILL SLIDE INTO THE LEAD RAIL.

1. The old fabric's trim insert will need to be removed from the roller tube, it is held on by clear tape along the length of the tube and black duct tape on each end. Take note of how the trim insert sits in the channel of the tube as the new fabric trim insert will need to be inserted correctly and then taped in the same fashion as the existing insert was attached.
2. With the new fabric attached to the tube, roll up the fabric as even and tight as you can in the correct direction. (The fabric should roll from the bottom of the tube when the awning is extending) Slide the tube with the motor and fabric assembly back into the case of the awning as it came out. Confirm the non motor side of the roller tube is correctly in the bushing that is mounted on the non motor side endplate.
3. Repeat steps 1-10 of motor installation section B.



ARM REPLACEMENT

Follow this procedure when a damaged, spring loaded arm needs to be replaced. There are no repairable parts inside of the arm, if the elbow joint has broken the entire arm must be replaced.

TOOLS REQUIRED:

5mm Allen wrench, 17mm wrench, 19mm wrench, Tie down or duct tape



WARNING

- Follow installation instructions carefully.
- Awning arms are packaged under heavy spring tension.
- To avoid serious personal injury do not remove protective wrapping until directed to do so.

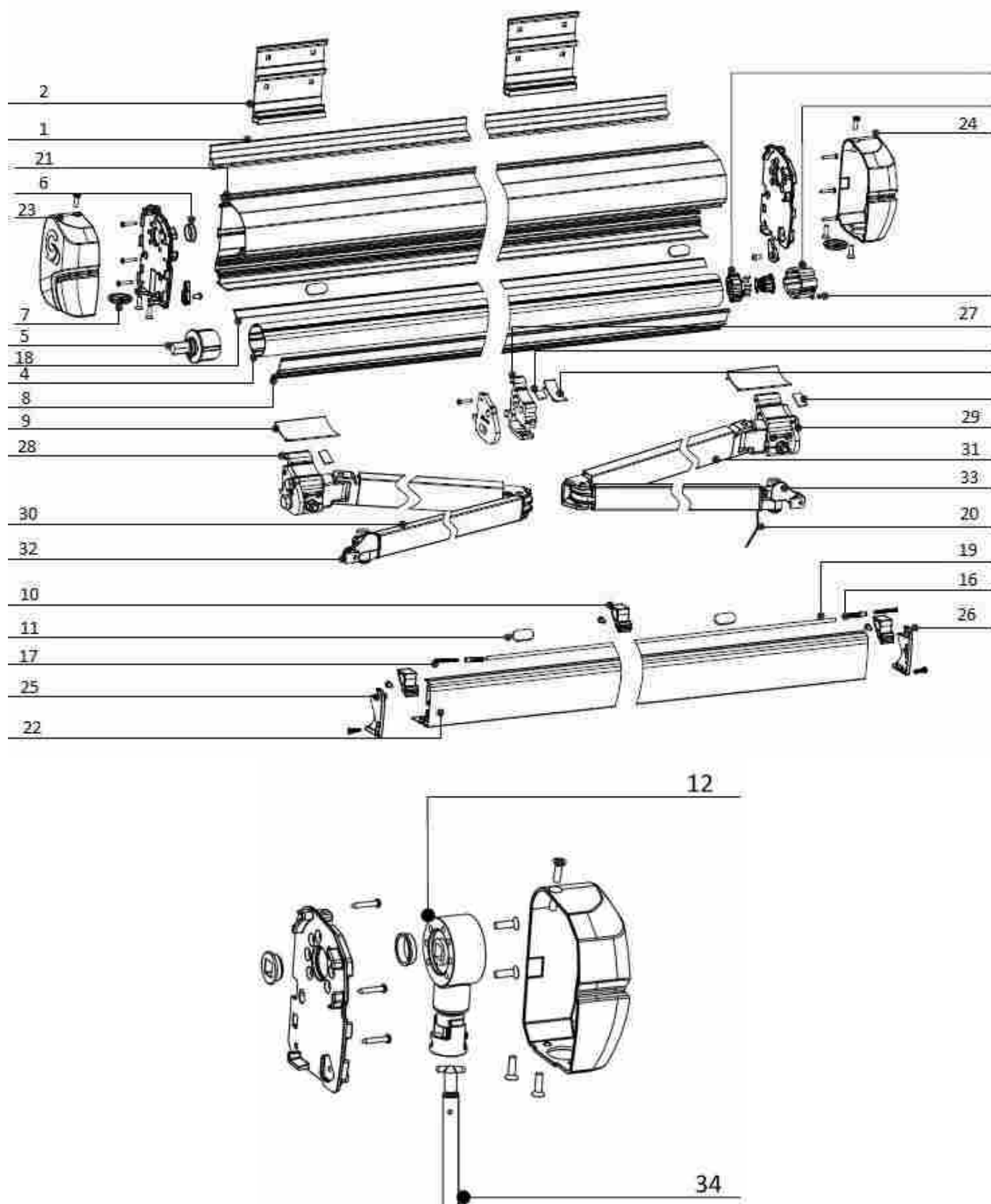
Check arm for wiring:
if wired arm, wiring will need to be replaced

- 1.** Support the lead rail and carefully open the awning a few feet. If the elbow is open tie a large rag around to protect the fabric from the elbow.
- 2.** Remove the 5mm Allen head screw at the lead rail connection, slide out the arm from the lead rail, fold and use a tie down or tape to secure the arm in the folded position very carefully.
- 3.** At the shoulder of the arm (connecting it to the main housing), loosen the 17mm and 19mm bolts on the side (Figure 11).
- 4.** With the shoulder bolts loose, this will allow removal of the arm from the shoulder. Ensure the 17mm and 19mm bolts stay in place on the shoulder.

NOTE: MAKE SURE TO LOOSEN (NOT REMOVE) THE PITCH ADJUSTMENT NUT (FIGURE 13) SO THAT THE ARM ATTACHMENT BOLTS ARE NOT ANGLED WHEN INSERTING NEW ARM.



-
- 5. Verify the metal sleeve is still on the 19mm bolt inside the shoulder.**
Attach the new arm to the shoulder using the 17mm and 19mm bolts, tightening both evenly.
 - 6.** With the awning open about 18", unband the high tension arm very carefully. Slowly guide it into position on the lead rail and fasten it in place with the 5mm allen head screw.
 - 7.** Adjust the arms' pitch angle to match the others by rotating the head of the pitch-adjustment screw (Figure 13, screw A) as follows; rotate in a clockwise direction to raise the arm, or rotate counterclockwise to lower it. Fully tighten both lock nuts on the shoulder assembly. Please refer to the "ADJUSTING THE PITCH ANGLE" section of this manual.
 - 8.** The elbow height may need to be adjusted, using the 17mm and 19mm bolts (Figure 11).





GG750 COMPONENT IDENTIFICATION

ITEM	DESCRIPTION	PART NUMBER (WHITE)	PART NUMBER (BLACK)
1	L Track Mount	7523001-01	7523002-01
2	Mounting Bracket	7523003-02	N/A
3	Sprinter Van Bracket Set	7523005-03	7523006-03
4	Roller Tube	7523007-04	N/A
5	Gudgeon	N/A	7523008-05
6	Bushing Insert	7526009-06	N/A
7	End Cap Hole Plug	7523010-07	N/A
8	Fabric Guide	7523011-08	N/A
9	Fabric Guide B	7523012-09	N/A
10	Shoulder Angle Guide	7523013-10	N/A
11	Foam Washer	7523014-11	N/A
12	Manual Crank Gearbox (Manual Verison Only)	7523015-12	N/A
13	Washer Plastic Side Plate	7523016-13	N/A
14	Bushing Insert Cover	7523017-14	N/A
15	Screw for Gear Box	7523018-15	N/A
16	Fabric Screw Anchor	7523019-16	N/A
17	Fabric Screw	7523020-17	N/A
18	Poly Rope Roller Tube	7523021-18	N/A
19	Fabric Poly Rope	7523022-19	N/A
20	Wire Electrical for Arm	N/A	7523023-20
21	Main Housing	7523107-W21	7523107-B21
22	Lead Rail	7523108-W22	7523108-B22
23	End Cap Left	7523109-W23	7523109-B23
24	End Cap Right	7523110-W24	7523110-B24
25	Lead Rail End Cap Left	7523111-W25	7523111-B25
26	Lead Rail End Cap Right	7523112-W26	7523112-B26
27	Roller Tube Support Bracket	7523113-W27	7523113-B27
28	Shoulder Assembly Left	7523114-W28	7523114-B28
29	Shoulder Assembly Right	7523115-W29	7523115-B29
30	Arm Left 3'3"	7523116-W30	7523116-B30
31	Arm Right 3'3"	7523117-W31	7523117-B31



Item	Description	Part Number (White)	Part Number (Black)
30	Arm Left 6'7"	7523118-W30	7523118-B30
31	Arm Right 6'7"	7523119-W31	7523119-B31
30	Arm Left 8'	7523120-W30	7523120-B30
31	Arm Right 8'	7523121-W31	7523121-B31
32	Lead Rail Connector Left	7523122-W32	7523122-B32
33	Lead Rail Connector Right	7523123-W33	7523123-B33
34	Manual Crank Handle (Manual Version Only)	7523124-W34	7523124-B34

AWNING REMOTES**SINGLE AWNING PART # 98GCK-57****DOUBLE AWNING PART # 98GCK-45D**



DC MOTOR CONTROLLER WITH LED FUNCTION

GC1146C

INSTALATION AND PROGRAMMING GUIDE

REV.12312015



RV AWNING PRODUCTS

1361 CALLE AVANZADO, SAN CLEMENTE, CA 92673 (800) 382-8442 FAX (949)276-5500

www.girardrv.com



Girard Systems awnings may be operated in light wind and rain conditions. When periods of heavy rain and or high wind are expected the awning must be closed. Never leave the awning open and unattended.

Damage caused by wind and rain is not covered by warranty.

All awnings must be closed prior to moving the vehicle for any reason. As an extra safety precaution a visual check that every awning is fully closed is required.

Damage caused by failure to comply with these instructions is not covered by warranty.

Before using your awning, ensure that the area into which the awning will be deployed is free of obstructions (Trees, walls, pillars, posts, other vehicles etc.)

Damage caused by collisions with any of the above or similar is not covered by warranty.

Before using your awning make sure that all of your electrical circuits are operating correctly. Recreational Vehicles can generate AC power from three separate sources. The electrical system transfer switch in your vehicle will select power for the awning as follows:

Shore Power – if connected;

Generator Power – if the generator is running;

Inverter Power – batteries must be charged for inverter operation.

Girard Systems awnings are supplied with an electric motor appropriate to the product.



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THE G-LINK SYSTEM

The G-Link motors and control modules provided by Girard Systems communicate by use of RF signals on a frequency of 433.92 MHZ. This eliminates the need for wiring and the drilling of holes in the vehicle. These components must be electronically matched, programmed or paired before use. This is usually done at the Girard Systems factory. Should the need arise for the user to pair a device with the motor controller they must refer to the appropriate manual for the devices applicable to their particular installation.

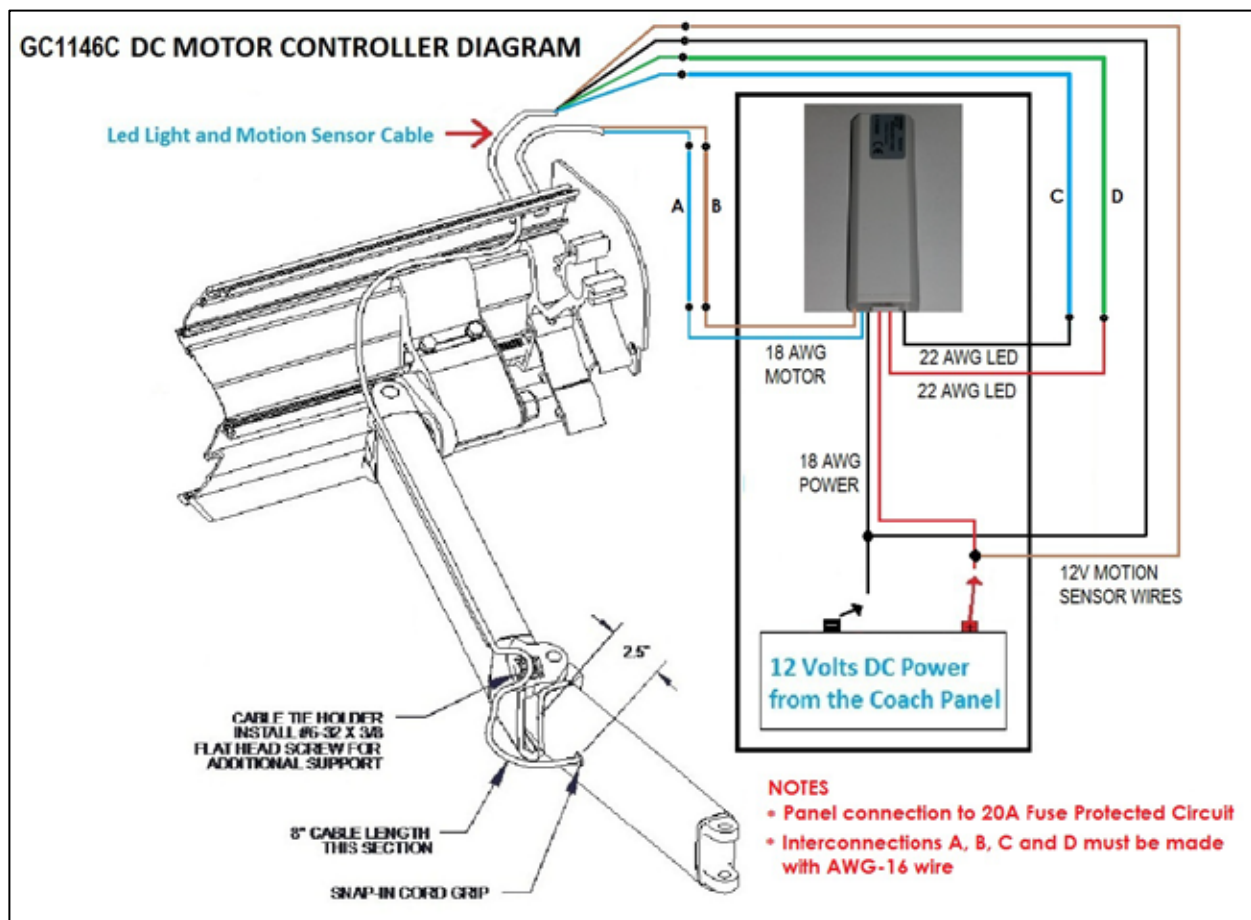
PRODUCT DESCRIPTION

The GC1146C is a 12v DC Motor Control Module which requires a 20 Amp Circuit breaker or fuse protected power supply, designed to control a single awning motor. The thicker RED and BLACK wires are the module's input power supply which should be connected to the vehicle's Power distribution panel. The thinner RED and BLACK wires are the 12v output to the LED lighting strip. The BLUE and BROWN wires are the 12v output which should be connected to the awning motor. The longer White wire is the modules RF antenna. The GC1146C has an operating frequency of 433Mhz, and a range of up to 650' in the open or 110' where there are obstructions. This module can be paired with up to 20 compatible RF remote devices. If additional devices are paired with the GC1146C, previously paired devices will be overwritten in turn from the second device onward.



WARNING

"To reduce the risk of electric shock the operator power is to be provided from a weatherproof junction box in the case of permanent wiring, as per 314.15 of the National Electrical Code, NFPA 70."
To prevent the motor protector from tripping do not exceed 2 minutes of operation per hour.





PAIRING WITH REMOTE DEVICES

The following pages give instructions on how to pair the GC1146C Motor controller with various compatible RF remote control devices. Please ensure that the correct set of instructions are followed for the device being paired with the Motor controller.

GC660B SINGLE CHANNEL WALL SWITCH

The faceplate can be removed easily by holding the module firmly in one hand at the left and right edges and push the STOP button with two fingers of your other hand.

Fig.1 below shows how the batteries must be inserted.



Fig.1



Fig.2

When pairing with the GC1146C it is advised that the awning to be controlled is manually extended couple of feet to enable the programmer to see if the awning is responding in the correct direction when the buttons on the wall switch are pressed.

The programming window for this module is only 10 seconds so please ensure that the programming instructions are read and understood before attempting to execute them.

- 1) Supply power to the motor control module. (It will beep ONCE).
- 2) Press the P2 button on the wall switch TWICE. (The motor controller will beep with each press)
- 3) Press the IN button on the wall switch. (The awning should retract)



If the awning extends at this point instead of retracting, press the STOP button immediately, then remove the power supply to the motor controller for at least 10 seconds.

Next repeat steps 1 and 2 above then press the OUT button on the wall switch to complete the programming procedure.

Ensure that the awning responds correctly to the wall switch by pressing the OUT, STOP and IN buttons alternately.

GC661B MULTI CHANNEL WALL SWITCH

The faceplate can be removed easily by holding the module firmly in one hand at the left and right edges and push on the faceplate below the display screen with two fingers of your other hand. Fig.1 below shows how the batteries must be inserted. Close the battery tray and replace the faceplate, you will find the pushbuttons clearly marked. See Fig.2 below.



Fig.1



Fig.2

When pairing with the GC1146C it is advised that the awning to be controlled is manually extended couple of feet to enable the programmer to see if the awning is responding in the correct direction when the buttons on the wall switch are pressed.

The programming window for this module is only 10 seconds so please ensure that the programming instructions are read and understood before attempting to execute them.



First determine which channel of the wall switch is to be paired with the motor controller, then;

- 1) Select the desired channel on the wall switch using the CH button.
- 2) Supply power to the motor control module. (It will beep ONCE)
- 3) Press the P2 button on the wall switch TWICE. (The motor controller will beep with each press)
- 4) Press the IN button on the wall switch. (The awning should retract)

If the awning extends at this point instead of retracting, press the STOP button immediately, then remove the power supply to the motor controller for at least 10 seconds.

Next repeat steps 1 and 2 above then press the OUT button on the wall switch to complete the programming procedure.

Ensure that the awning responds correctly to the wall switch by pressing the OUT, STOP and IN buttons alternately.



98GC1063 SINGLE CHANNEL HANDSET



Fig.1



Fig.2

The 9GC1063 is the simplest of devices, IN and OUT buttons clearly marked. If you should wish to stop the awning at any point press the center of the control pad. See Fig.1 Above. On the back of the handset you will find the P2 button and the battery tray.

The programming window for this module is only 10 seconds so please ensure that the programming instructions are read and understood before attempting to execute them.

- 1) Supply power to the motor control module. (It will beep ONCE)
- 2) Press the P2 button on the handset TWICE. (The motor controller will beep with each press)
- 3) Press the IN button on the handset. (The awning should retract)

If the awning extends at this point instead of retracting, press the STOP button immediately, then remove the power supply to the motor controller for at least 10 seconds.

Next repeat steps 1 and 2 above then press the OUT button on the handset to complete the programming procedure.

Ensure that the awning responds correctly to the handset by pressing the OUT, STOP and IN buttons alternately.



98GC1029 5 CHANNEL HANDSET

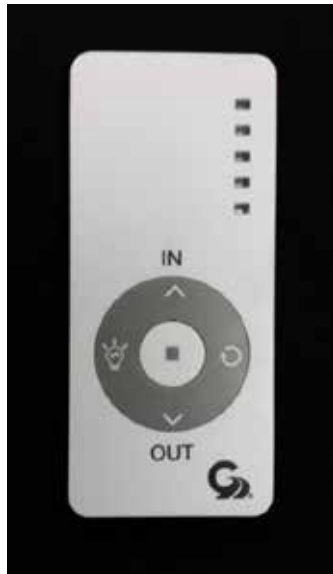


Fig.1



Fig.2

The 98GC1029 remote handset is a 5-channel RF transmitter, which is powered by a single 3v Lithium battery (CR2430) designed to control up to 5 awnings and operates the LED lighting strips by means of a multi-functional circular control pad. As shown in Fig.1 above.

Note; when carrying out this part of the procedure each step must be executed within 10 seconds of the previous one or the module will revert to factory settings. It is highly recommended that you read and understand the following sequence before attempting to execute it.

- 1) Supply power to the Motor controller. (The GC1146C will emit a soft beep)
- 2) Select the desired channel on the remote handset.
- 3) Using an appropriate tool press the P2 button on the back of the Handset TWICE. (The GC1146C will Beep with each press)
- 4) Press the IN button on the wall switch and verify that the awning moves in the desired direction.

If the awning extends at this point instead of retracting, press the STOP button immediately, then remove the power supply to the motor controller for at least 10 seconds.

Next repeat steps 1, 2 and 3 above then press the OUT button on the wall switch to complete the programming procedure.

Ensure that the awning responds correctly to the wall switch by pressing the OUT, STOP and IN buttons alternately.



PAIRING WITH ADDITIONAL DEVICES

As mentioned in the Product description the GC1146C can be paired with up to 20 compatible devices, wall switches handsets and others. The first device to be paired with the 98GC74 Motor Controller shall now be referred to as the PRIMARY REMOTE which is used to program all additional devices which shall be referred to as the SECONDARY REMOTE or SECONDARY DEVICE. To add a secondary device to the motor controller, carefully follow the steps below.

Note; when carrying out this part of the procedure each step must be executed within 6 seconds of the previous one or the module will revert to factory settings. It is highly recommended that you read and understand the following sequence before attempting to execute it.

- 1) First ensure that the Primary remote device is functioning correctly.
- 2) Ensure that the Secondary device has the battery /batteries inserted correctly.
- 3) Press the P2 Button on the Primary Remote TWICE (The Motor controller will beep with each press)
- 4) Press the P2 Button on the Secondary remote ONCE (The motor controller will beep again)
- 5) Press IN or OUT on the Secondary remote and ensure that the awning responds accordingly.

REMOVING AN ADDITIONAL DEVICE

Select the Secondary device that is to be removed from the 98GC74's list and follow the steps below;

- 1) Press the P2 Button on the device ONCE (The Motor controller will beep in response.
- 2) Press the STOP Button on the device ONCE.
- 3) Press the P2 Button on the device again. The Motor controller will beep several times indicating that the secondary device has been cancelled.



PAIRING WITH A GC116I ANEMOMETER

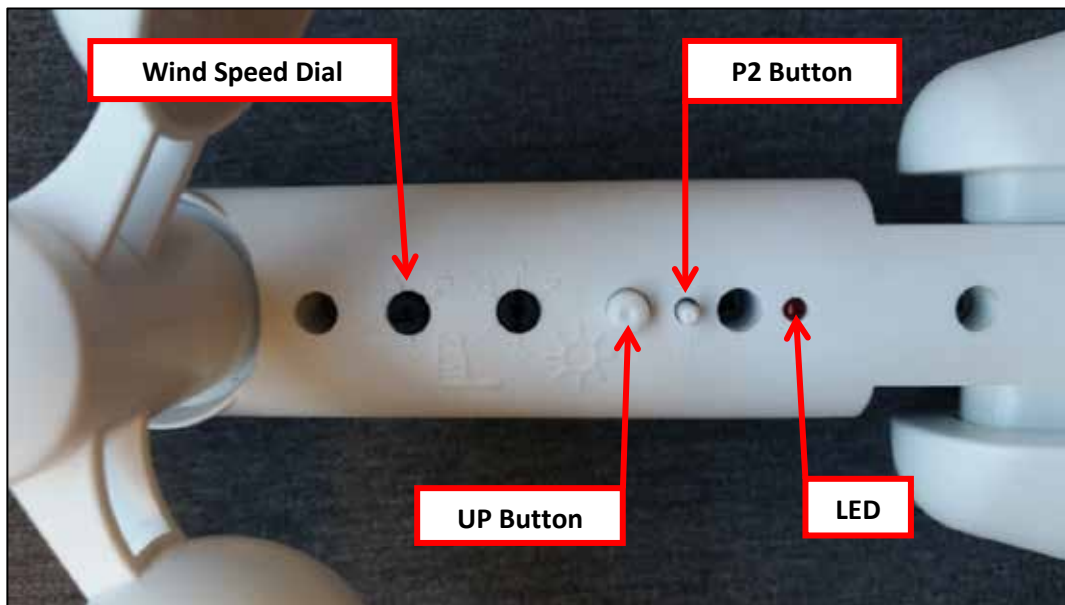


Fig.1

- Fully extend the awning to ensure smooth operation, then retract the awning leaving it partially open (about 3 feet).
- Locate the P2 Button on the back of the Primary remote.
- Set the wind speed dial between 1 and 2 on the anemometer. See Fig.1 above.

Note; when carrying out this part of the procedure each step must be executed within 6 seconds of the previous one or the module will revert to factory settings. It is highly recommended that you read and understand the following sequence before attempting to execute it.

- 1) Connect the Anemometer to a 12V DC Power source. (The Red LED will flash once when power is connected)
- 2) Press the P2 button on the back of the Primary remote TWICE (The Motor controller will beep with each press)
- 3) Press the P2 button on the Anemometer ONCE (The motor controller will beep several times to indicate that the program has been accepted)
- 4) Press the up button on the Anemometer or physically activate it by spinning the cups to retract the awning.



PAIRING WITH A MOTION SENSOR

Identify the Primary remote which operates the Motor controller for the awning on which the motion sensor is to be mounted. There may be more than one on the vehicle.

Prepare the Motion Sensor for pairing by carrying out the following procedure.

Remove the 2 small Phillips screws which secure the motion sensor to the mounting bracket. The base of the module is magnetized so will need to be gently lifted off.



Fig.1

Then turn it over.



Fig.2



Remove the 4 Phillips screws holding the module together. Remove the base plate and silicone insert.

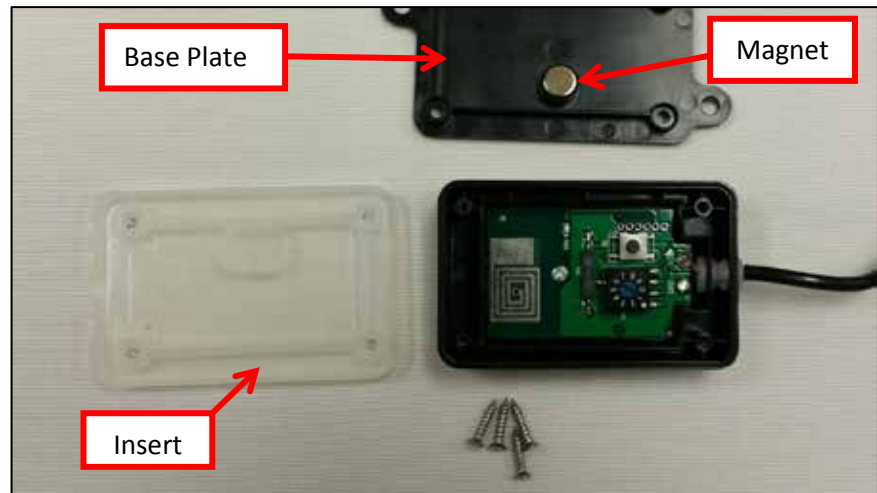


Fig.3

Turn the base plate over (Magnet down). Then place the motion sensor on top of it so that the magnet is aligned with the reed switch. **If this is not done the default program cannot be changed.**

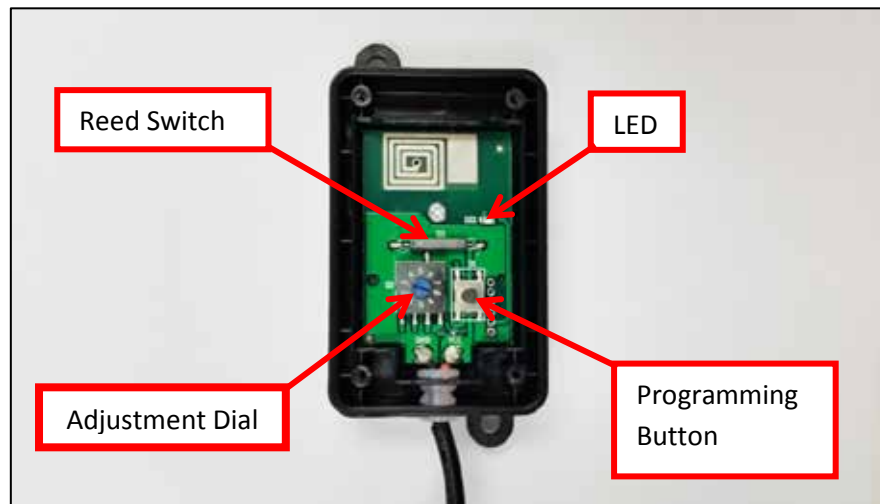


Fig.4

Fully extend the awning to ensure smooth operation, then retract the awning leaving it partially open (about 3 feet).

Locate the P2 Button on the back of the handset.



Note; when carrying out this part of the procedure each step must be executed within 6 seconds of the previous one or the module will revert to factory settings. It is highly recommended that you read and understand the following sequence before attempting to execute it.

- 1) Set the Motion sensor Adjustment Dial to 0. (See Fig.4).
- 2) Connect the GC779G Motion sensor to a 12volt DC circuit. At this point the Purple LED will illuminate and then begin to blink. If it does not, the unit is not receiving the correct power. Ensure that the magnet and reed switch are aligned and verify the electrical connection before proceeding.
- 3) Using an appropriate tool, press the P2 Button on the back of the Remote Controller TWICE. The GC1146C will bleep ONCE with each press.
- 4) Press the programming button on the GC779G Motion sensor ONCE (See Fig.4). The GC1146C will bleep several times to indicate that the program has been accepted.
- 5) Ensure that the code was accepted by pressing the Program button on the GC779G Motion sensor again. The Awning should make a small step IN or OUT. Or shake the motion sensor and the Awning will fully retract.
- 6) If the Awning does not retract, repeat steps a. to d.
- 7) Set the Adjustment Dial to the desired sensitivity level 1 to 5. **Never set higher than 5.** (The factory setting is 3).

Once programming is complete, reassemble the Motion sensor module and mount it on the awning lead rail.

For queries or assistance with programming any of your G-Link devices please call Girard Systems TOLL FREE on 800-382-8442 between 7:30am and 3:30pm P.S.T.



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1. Instructions and Use

This manual contains warnings to signal dangers to the user or particular behaviour to comply with; these warnings are indicated as follows:



WARNING!



Do not start the product before reading this instruction manual.

Obligation to read instructions The presence of this symbol mandates reading of instructions before putting the unit into operation.	
Obligation to disconnect The presence of this symbol mandates immediate disconnection of the unit from the mains in case of failures.	
Obligation to wear gloves The presence of this symbol mandates each operator wear suitable protective gloves.	
Obligation to wear shoes The presence of this symbol mandates each operator wear shoes designed to decrease the risk of injury.	
General hazard The presence of this symbol mandates special attention by the operator.	
Shock Hazard The presence of this symbol tells personnel involved that the described operation may present a risk of electric shock.	
High intensity light hazard The presence of this symbol indicates that you must take special care with the high intensity bright lights, risk to eyesight.	



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WARNING! This manual must be kept for future reference. We recommend that users:

- Store this manual in an accessible location protected from moisture and heat and protected from the direct rays of the sun.
- Use the manual in such a way as to avoid damaging it or any part of its content.
- Do not remove, alter or tear on any part of the manual.


Despite the care and thoroughness with which this manual has been prepared, Indel Webasto Marine Srl cannot guarantee that the information within covers every possible event associated with installation of the product. Contact our technicians immediately in the event of uncertainty. In the event of selling or transferring the unit to another person, this manual and related documents should be delivered intact to the new user.

1.2 Environment

This product complies with the Directive 2002/96/EC regarding waste electrical and electronic equipment (WEEE).

The product's proper disposal is essential to preventing negative consequences for the environment and human health.




The symbol  on the product, the packaging and/or the accompanying documentation indicates that the product should not be disposed of as household waste. The product must be taken to an authorized collection centre for the recycling of electrical and electronic equipment. The product must be disposed of in compliance with the current local environmental regulations regarding waste disposal.

For more information regarding the disposal, recycling and reuse of the product, please contact your local authorities, your local waste collection service or the retailer/distributor from whom the product was purchased.

Packaging is manufactured from recyclable material. It bears the



recycling symbol and  must be delivered to a collection centre.



The symbol indicates that the product complies with all European Union provisions provided for its use.



WARNING! This unit contains fluorinated greenhouse gas R134a within a hermetically sealed system whose operation depends on the presence of said gas.



WARNING! Never open the refrigerant circuit except for the normal connection/disconnection of couplings (where present). The R134a refrigerant contained within the unit is non-flammable in normal conditions. Never dispose of the refrigerant R134a in the environment.

Contact a qualified certified technician for handling fluorinated gases in the event of damage to the refrigerant circuit.

1.3 Safety Standards



WARNING! Indel Webasto Marine Srl disclaims all liability for any malfunction or damage to persons or property due to improper use of the machine or with materials with different characteristics than those described in this manual.

Improper use or use of the product not in line with the information contained in this manual cannot result in claims against the manufacturer and/or supplier.



WARNING! The refrigerator is only suitable for the preservation and/or storage of food items. The food items must be stored in their original packing or else in suitable containers. Do not consume expired food products as such behaviour could result in food poisoning.



WARNING! If medicines are to be stored in the refrigerator, check that the unit has a cooling capacity that will meet the requirements of the respective medicines.



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WARNING! The only purpose and function of the product when used as a freezer is to maintain already frozen food completely frozen.

The refrigerator will not freeze non-frozen or partially frozen food products. If a non-frozen or partially frozen food product is stored in the freezer, this is considered improper use and can cause possible unintended thawing of food which may lead to problems related to safety, illness or injury if swallowed.

The preservation of non-frozen or partially frozen food in the freezer can also affect the quality of other frozen food products stored in the freezer.

Exposure to temperatures above the temperature of the climatic class range for which the freezer was built, power supply interruptions and/or frequent opening of the freezer can influence the effectiveness of the refrigerator and the quality of the contents of the freezer.

The user should always check food quality before ingesting.



WARNING! For extended periods of disuse or when defrosting, remove the



unit's light bulb or disconnect all of its power supplies. Leave the refrigerator door slightly open to air out the inside of the product and prevent the formation of mould.



WARNING! Eliminate all sources of heat and sparks within the unit's vicinity; in the event of coolant leakage, remove the unit's power plug and ventilate the room thoroughly.



WARNING!



Disconnect the unit from the mains power supply immediately in the event of any malfunction. Never touch any damaged or non-insulated electrical cables while the electrical power supply is enabled. This observation is particularly true when the unit is connected to 115V or 230V mains voltage.

If the power cable is damaged, it must be replaced. Contact qualified personnel or the Service Centre.



WARNING! Do not store inside the unit or in the vicinity of its electrical parts: flammable substance-based spray cans, explosive materials, electrical equipment, live animals.

Spray cans containing flammable substances may have leakage of these gases which, in contact with electrical parts, can ignite or cause explosions.

Keep any drinks with high alcohol content tightly closed and upright.

Avoid flames or sparks inside the unit.

Do not use electrical equipment inside the refrigerator.



WARNING! The unit can be used by children under 8 years of age and by people with reduced physical, sensory or mental capabilities, or lack of experience or knowledge, provided they are supervised or after they have received instructions on safe use of and understanding of the dangers inherent in it.

Children should not play with the unit. Cleaning and maintenance meant to be performed by the user and must not be performed by unsupervised children.



WARNING! Do not use plugs and switches if you have wet hands or feet.



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2. Usage instructions

The climate class is indicated on the data plate inside the unit itself.

SN or **extended temperate class** (ambient temperature from 10°C to 32°C)

N or **temperate class** (ambient temperature from 16°C to 32°C)

ST or **subtropical class** (ambient temperature from 16°C to 38°C)

T or **tropical class** (ambient temperature from 16°C to 43°C)

2.1 Thermostat-controlled temperature regulation

The refrigerator's temperature is continuously regulated by the thermostat, which also includes a power-off function if turned counter clockwise to the end position.

In order to turn off the unit, it is necessary to overcome the slight resistance of the knob. The location of the thermostat knob depends on the type of refrigerator.

To adjust the temperature, proceed as follows: turn the thermostat clockwise to lower the temperature, and vice versa.

It is recommended to keep the refrigerator at a temperature of 5-6°C. Since the outside temperature can affect the refrigerator's internal temperature, it can be difficult to maintain the desired temperature when the refrigerator is exposed to heat and/or direct sunlight.

Thermostat Knob





2.2 Usage recommendations

- If possible, the refrigerator should be turned on for about 6 hours prior to inserting the food items.
- Frequent opening of the refrigerator door will result in greater power consumption.
- Ensuring adequate ventilation for the compressor and the condensing unit will significantly reduce power consumption.
- Never obstruct the refrigerator's ventilation system.
- The electrical system must be kept in good condition. Inspect the batteries and check the charge levels regularly. Always use a starter battery separate from the motor.
- Keep the inside of the refrigerator clean and dry. Remove the condensation water from the drip tray beneath the refrigerator's freezer compartment where present.
- To keep the surface of the door in good conditions and intact, make sure that it is always clean and dry.
- The unit has been designed with a product lock protection in the event of low battery voltage. In the event of a compressor block, follow the instructions in this manual and/or contact specialised technicians or Indel Webasto Marine Srl service centres.
- The compressor can operate up to an angle of 30°, while greater angles can cause permanent damage to the compressor.



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2.3 Defrosting

Since the evaporator operates at temperatures well below freezing, ice and frost will inevitably form upon it.

The humidity in the air, the temperature and the number of times the door is opened will have a significant impact on frost formation.

The refrigerator should always be defrosted when the layer of frost on the evaporator reaches a thickness of 3-4 mm or more.

Turn off the refrigerator by turning the thermostat to its 0 position.

Defrosting should be performed when the products can remain as cool as possible outside of the refrigerator itself. Do not use sharp objects to remove ice and frost from the evaporator, as this could damage it and result in leaks.

Only turn the refrigerator back on once it has been defrosted, cleaned and thoroughly dried. Remove, empty and dry the drip tray beneath the evaporator. A towel can be placed at the base of the refrigerator during the defrosting procedure in order to facilitate water collection.

3. Maintenance

Isotherm Cruise & Cruise Elegance refrigerators are equipped with closed cooling systems, which do not require maintenance or refrigerant refills.

The compressor is specifically designed for mobile applications and guarantees maximum performance and durability. In the winter, the refrigerator must be stored inside the vehicle, but the compressor will not work at temperatures near or below 0°C. Seasonal maintenance is limited to the cleaning of the condensing unit behind the refrigerator. In particular, it is necessary to brush/vacuum out all the dust that has accumulated due to the fan. This can be done using a soft brush and a vacuum cleaner. It is important to keep the inside of the refrigerator clean by washing it with warm water and mild soap and by drying any water/condensation that may be encountered.

To keep the surface of the door in good conditions and intact, make sure that it is always dry and clean.

In order to prevent damage to the electrical/mechanical components and/or the formation of mould, when shutting off the refrigerator for extended periods of time it is necessary to wait for the unit to defrost completely and to eliminate any



condensation that may have formed, both inside the unit and in the external water collection tray. The natural defrosting time can vary from a few minutes to several hours. In the wintertime and when the refrigerator is shut off, the door should be left slightly ajar for ventilation and **all power disconnected**.

Classic model ventilation:

Classic models are equipped with a handle with special stopper designed to leave the door in position for ventilation.

To set the door in the ventilation position, use a knife or coin to release the stopper (Fig. 5). Once the stopper has been released, hook the door in the ventilation position.

Elegance model ventilation:

Elegance models are equipped with a special door stopper system to set the door in the ventilation position inserted in the top of the refrigerator.

To set the door in ventilation position, push the door stopper toward the right to the ventilation position "--> TO VENT" (Fig. 6).

3.1 Low voltage protection

In order to prevent excessive battery depletion, a protection device shuts off the compressor in case of insufficient voltage and turns it back on when the voltage in the system increases after the batteries have been charged.

System Voltage	Shut-down Voltage	Minimum Operating Voltage
12V	9.6 (10.4) V	10.9 (11.7) V
24V	21.3 (22.8) V	22.7 (24.2) V

If the bridge is removed between C and P, the values indicated in the parentheses are valid.



WARNINGS: Before switching on the unit, always make sure that the batteries are in optimal condition.



User Manual

4 Installation Warnings



WARNING!



In order to guarantee the unit's safe functionality, follow the indications included with in these instructions when installing and connecting the unit.



WARNING! Always use PPE



(Personal Protective

Equipment) during product handling and installation.



WARNING! Any changes made to the product without the knowledge of the manufacturer will be the sole responsibility of those carrying out said changes. Changes made without the permission of Indel Webasto Marine Srl will void all warranties and may void the declaration of conformity to applicable directives.



WARNING! Check for any visible damage on the refrigerator's mechanical and electrical components prior to use.



WARNING! Do not damage refrigerant circuit pipes. Coolant sprays can damage eyesight.



WARNING! In the event of damage to the unit itself, notify the supplier immediately before performing the connections.



WARNING! If the power cable is damaged, it must be replaced by the manufacturer, an authorized Service Centre or a qualified technician.



WARNING! Install the refrigerator in a dry place that's sheltered against water spray. The unit's electrical components must NOT be exposed to rainfall and/or



sprays of water.



WARNING! Install the refrigerator away from gas or LPG cylinders.



WARNING! The product must be installed in an area accessible for any maintenance. The housing space of live parts and of the condensing unit/compressor must only be opened voluntarily and not directly accessible.



WARNING! The compressor/condensation unit installation area must be made with a material resistant to the needle-flame test required by standard EN 603335---1 or else be more than 5 cm from electrical and/or electronic components.



WARNING! If there is a battery charger, it must be connected to the battery and never directly to the refrigerator.



WARNING! The appliance must be protected against indirect contact in accordance with the "Heavy Current Regulations".



WARNING! In case of power connection from AC mains, to avoid the risk of serious personal injury, ensure that it is equipped with cut-off devices (switches) which permit total disconnection of the unit current and protective devices which automatically intervene in the event of malfunction.



WARNING! Never touch any damaged or non-insulated electrical cables while the electrical power supply is enabled. This observation is particularly true when the unit is connected to 115Volt or 230Volt mains voltage.



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4.1 Installation

Isotherm refrigerators have been designed and constructed exclusively for recessed installation and installation that is in compliance with standard dimensions. The refrigerator must always be in a horizontal position, with the compressor's rubber feet at the bottom. The compressor is capable of functioning at angles of up to 30°. The compressor can become damaged with any higher inclinations.

In the CR42 model, the compressor is installed on a removable corner plate and comes supplied with extra tubing made from a particularly flexible material, so it can be set for remote operation up to nearly 1.5m from the refrigerator. The tubing must be carefully arranged so that it does not get pinched or broken at the curves.

Also remote operation compressors must be installed with its rubber feet downward.

Mounting flanges are available as an accessory in order to simplify the refrigerator's installation (for models that don't come supplied with a standard fastening flange). The refrigerator must always remain resting upon its rubber support feet, and must be fixed in place by the mounting flanges.

Elegance models can be fixed to the lodgings by means of the Easy Fix system. This system involves four special pre-drilled points inside a trunk, for easy and effective installation that is not visible from the outside (Fig. 12).

With Easy Fix, you can install Cruise Elegance units with the door flush to the furniture without using a special mounting flange. For this installation, you must leave 10 mm of space between the refrigerator and the furniture unit at least for the entire thickness of the door, thus ensuring its free movement (Fig. 11).

When it is not possible to use the mounting flange, secure the refrigerator in such a way so that it will not tip/slide forward when the drawer is opened or in the case of sudden vehicle movement. The unit should be anchored by at least 2 fastening points, in accordance with the provisions of the EN 60335-2-24 standard.



4.2 Ventilation

It is extremely important for the compressor/condensing unit located behind the refrigerator to be well ventilated so that the fresh air can enter at the bottom and pass behind the refrigerator, with the hot air being allowed to escape from the top or sides (Fig. 1). The illustrations (Fig. 2-3) show an example of how the refrigerator housing should be set.

4.3 Door Panelling

Cruise Classic refrigerators are supplied as standard with gray door panels. Optional panels are available in other colours and finishes.

Cruise Elegance refrigerators are supplied with silver aluminium door panels. Optional panels are available in other colours and finishes.

Inox models come equipped with a stainless steel door without replaceable door panels.

A replacement door panel can be installed over top of the standard gray panel on Cruise Classic models. To do so, remove the lower plastic gasket, pulling it downward, and then remove the door handle equipped with three screws (Fig. 10).

To change door panelling on Cruise Elegance models, delicately remove the 4 lateral panel locking strips, remove the small handle frame and then it will be possible to remove the panel. Insert the new panel and delicately reinstall the lateral strips and the handle frame (Fig. 9).

This procedure is illustrated on our “Indel Webasto Marine”  channel.

4.4 Door Reversibility

The opening direction of Isotherm Cruise (not including CR200) & Cruise Elegance refrigerator doors can be reversed to meet installation requirements.

To reverse the opening direction of the door in Cruise Classic and Inox models, remove the screws securing the top (no top is present on Inox models) and the fastening pins, remove the door, reverse the fastening hinges as illustrated (Fig. 7) and re-insert the door and re-tighten all parts. To reverse the opening direction of the door in Cruise Elegance models, remove the screws securing the top and the fastening pins, remove the door, reverse the fastening hinges as illustrated (Fig. 8) and re-insert the door and re-tighten all parts.



User Manual

4.5 Electrical Connections

- In order connect the unit to the vehicle's electrical system, proceed as follows:
- Before turning on the appliance, check to make sure that the voltage of the electrical system and/or battery complies with that which is indicated on the unit's data plate.
- Connect the refrigerator directly to the battery or to the relative main switch and make sure that the system is equipped with an electric device that's capable of protecting the circuit against possible overcurrents.

If the power supply voltage is different from 12/24Vdc, install a ΔI 0.03A differential circuit breaker. Avoid connecting the unit via the vehicle's control panel as this could result in voltage drops.

- Insert a fuse upstream from the refrigerator (see the table below). Connect the red wire to the electrical system's positive terminal, and connect the black wire the negative terminal. Use a pressed lug terminal that's suitable for the cable's size.
- A separate switch that simultaneously disconnects the power cables must be installed upstream from the refrigerator. Check to make sure that the installed switch supports the corresponding load indicated in the table below.

Models	12Vdc	24Vdc
CR36, CR40CUBE, CR42, CR49, CR63F, CR65, CR65F, CR85, CR90F, CR90BIG, CR100, CR130, CR130D (Elegance models included)	15A	7.5A
CR195	25A	12.5A
CR200	20A	10A



WARNING! If there is a battery charger, it must be connected to the battery and never directly to the refrigerator.

All wiring diagrams can be found at the end of the manual.



4.6 Size of the electrical cables

Always use cables of a suitable cross-section. The minimum cross-sections are listed in the table below:

Cross-section in mm ²	AWG section	Max 12 V cable length m/ft	Max 24V cable length m/ft
BD1.4F / BD35F / BD50F			
2.5	13	2.5/8	5/16
4	11	4/13	8/26
6	9	6/19	12/39
10	7	10/33	20/66
BD80F			
6	9	2,5/8	5/16
10	7	4/13	8/26

4.7 Internal lighting

In order to replace the LED light bulb, slide the lighting unit's glass down using the appropriate lever. Replace the light bulb and to return the lighting unit to its original state (Fig. 4).

Only use original Indel Webasto Marine Srl spare parts.



User Manual

4.8 SEC - "Smart Energy Control" (optional)

With the Isotherm "Smart Energy Control" System, Indel Webasto Marine offers its clients the unique opportunity to drastically reduce the power consumption of their on board refrigeration systems. This kit can be easily installed in order to update and improve the energy-saving capabilities of your Isotherm refrigeration product. The new Cruise Elegance line already comes with a predisposed cabinet for "SEC" system installation.

How does it work?

The sophisticated technology of the processor-based Isotherm Smart Energy Control system ensures significant energy savings by continuously scanning a series of key environmental factor (using advanced proprietary algorithms) in order to determine the best compressor speed to maximize the battery's coefficient of performance (COP).

The device not only renders your refrigerator more intelligent, but also allows for a significant amount of cold energy stored in food and soft drinks to be saved. The Isotherm Smart Energy Control system reduces the temperature of the cabinet more than traditional refrigerators, without freezing the food. The temperature is continuously monitored by an air sensor in the cabinet. The cooling energy is stored and reutilized whenever a power surplus is available (with the motor running or with a connection to the mains network available), before the refrigerator switches to battery power.

The result: savings of up to 35% thanks to more efficient use of the compressor and up to 50% thanks to the combined effects of the cooling energy stored in the food and drinks.

Please see our "Indel Webasto Marine"  channel for correct, safe installation of the "SEC" system.



5 Technical data (standard configurations)

Operating voltage: 12 or 24 VDC

Average consumption measured with internal temperature +5°C and outside temperature 25°C. Average consumption is influenced considerably by the way the refrigerator is used and the type of ventilation.

Refrigerant: R134a (the system's capacity is indicated on the refrigerator's data plate).

The refrigerators meet the requirements of the EMC directive and bear the CE marking.

Model	Instantaneous consumption 12/24Vdc (Amperes)	Instantaneous consumption 12/24Vdc (Watt)	Average consumption at 25°C (Watt/24h)
CR36	6.0/3.0	72	300
CR40 CUBE	6.0/3.0	72	186
CR42	5.5/2.25	66	300
CR42 EL	5.5/2.25	66	285
CR49	6.0/3.0	72	280
CR49 EL	6.0/3.0	72	265
CR63F	6.0/3.0	72	440
CR65	6.0/3.0	72	290
CR65 EL	6.0/3.0	72	275
CR65F	6.0/3.0	72	440
CR85	6.0/3.0	72	380
CR85 EL	6.0/3.0	72	368
CR90F	6.0/3.0	72	550
CR90 BIG	6.0/3.0	72	520
CR100	6.0/3.0	72	400
CR130	6.0/3.0	72	440
CR130 EL	6.0/3.0	72	418
CR130 D	6.0/3.0	72	400
CR195	6.0/3.0	72	840
CR200	7.0/3.5	84	800



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6 Troubleshooting

All work on electrical parts or electrical connections and the refrigerant circuit must be carried out by qualified and authorised personnel.

Warning: Disconnect electrical power before performing any operations on electrical parts or on electrical connections.

Defect	Possible cause	Intervention
The refrigerator does not cool, the compressor will not start.	No electrical power. Battery in poor conditions. Faulty thermostat. Defective electronic control unit.	Check to make sure that the electronic control unit is receiving sufficient power and voltage; check the fuse. Verify that the internal lighting is working and that the compressor is receiving power. Check the cables, lugs and connectors. Verify that the battery is charging properly. Check the thermostat: Bridge T - C with a separate cable. If the compressor will not start, its electronics are probably defective. Replace. If the compressor starts up with the bridge, the thermostat is defective. Replace the thermostat.
The compressor only performs brief attempts at starting up.	There is insufficient voltage or else a drop in voltage during the attempt to start. The protection device is activated. The Batteries are drained.	Check the cables and connections; remove any traces of oxidation or corrosion. Charge the batteries, start the motor or connect the battery charger.
The compressor functions but doesn't cool.	Loss of refrigerant through the evaporator or the tubing. Tubing clogged.	Carry out a leak check and repair any leaks, drain and refill the proper amount of R134a refrigerant. (This operation must be carried out by a qualified technician.)
The compressor runs for a long time but doesn't cool properly (reduced efficiency).	Insufficient ventilation, the condensation unit is overheating. The fan is not working properly. There is too much frost on the evaporator. The door does not close properly and lets in warm, moist air. The condenser is blocked by dust.	Increase the ventilation. Replace the fan. Defrost the unit. Correct the position of the door and check the gasket. Clean the condensing unit.



The fuse blows.	The wrong fuse is being used. Defective electronic control unit.	Check the fuse: see table in section 4.4. Replace the electronic control unit.
The compressor is operating intermittently.	Battery low or electrical cables in poor conditions.	Check wiring conditions, examining for loose connections, rust or verdigris. If wiring needs to be replaced, see the manual for correct sizing. If wiring is in good conditions, check battery function and replace if in poor condition.
The compressor never stops (correct fridge performance)	Incorrect thermostat connection on the electronic control unit. Thermostat broken. Condensation is not working properly, evaporator cools but not enough to cause the thermostat to stop the compressor.	Rotate the thermostat to off position. If the refrigerator continues to function, then there is continuity on the control unit. Correct the problem on thermostat connections (make sure the bridge is present on C and P and not on C and T on the electronic control unit). Rotate the thermostat to off position. If the compressor switches off but it is impossible to regulate temperature, replace the thermostat or recharge the cooling system.
The compressor never stops (poor fridge performance)	Environment very hot + insufficient ventilation or little gas in the refrigerant circuit.	Check ventilation. The compressor must be installed in a well-ventilated location. If possible, remove the refrigerator from the installation hole. If the refrigerator operates better, improve ventilation, consulting the manual for correct installation. If ventilation is instead optimal, check for the presence of gas in the system, contacting a specialised technician.
The freezer compartment is cold but the refrigerator is not	Insufficient ventilation, little gas in the refrigerant circuit, electrical power not continuous.	Check ventilation. The compressor must be installed in a well-ventilated location. If possible, remove the refrigerator from the installation hole. If the refrigerator operates better, improve ventilation, consulting the manual for correct installation. Check electrical connection and battery conditions. If ventilation is instead optimal, check for the presence of gas in the system, contacting a specialised technician.



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Excess ice on the evaporator.	Moisture infiltrations in the refrigerator.	Check the conditions of the gasket on all four sides of the door. The gasket must close perfectly on the unit. If the formation of ice is thicker on one side, most likely there is moisture infiltration in the refrigerator is coming from that side. Use a moderate heat source to model the gasket into position. If the gasket cannot be modelled, replace the entire door.
The refrigerator cools too much.	The thermostat sensor is too covered or incorrectly positioned	The end of the sensor must be in contact with the evaporator. Set the sensor in the correct position. If the refrigerator continues to cool too much, replace the thermostat.
The compressor is noisier than normal.	The compressor is not properly secured on its support or it is touching the wall.	Check that compressor screws are properly tightened and that nothing is in contact with it. The compressor vibrates and, if something is in contact with it, vibrations increase.
The fan/s is/are noisier than normal.	The fan structure is bent or the fan is broken.	Remove the clamps/screws used to secure the fan. Replace if the fan continues to make noise. Make sure that all of the fan is intact. Replace if one or more fins is missing.
The internal light does not switch on.	Polarity reversed or broken bulb.	Check bulb polarity. Replace light bulb if polarity is correct.
Door/Drawer not closing properly.	Incorrect position of hinges or deformed gasket.	Re-position hinges so that the door closes correctly. Use a moderate heat source to remodel the gasket. Replace door if problem persists. In the case of drawer refrigerators, use the adjustable guides to align the door.

For more complicated defects requiring specialised assistance, please contact Indel Webasto Marine S.r.l. Italia or your nearest Isotherm retailer.

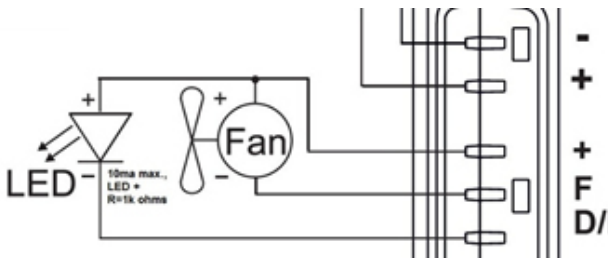


7 LEDs for diagnostics

The electronic control unit has a troubleshooting function when a LED is connected as shown below.

The number of flashes indicates the type of error.

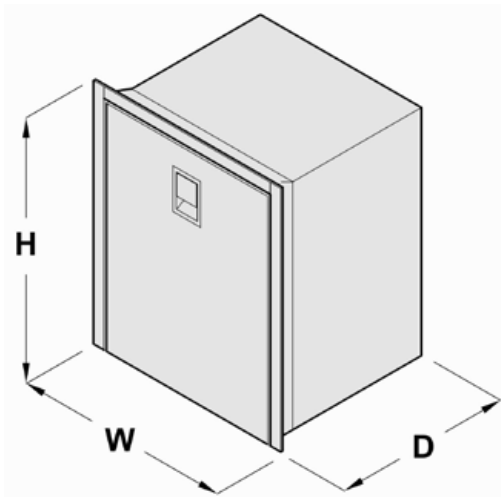
Number of LED Flashes	Type of Error	Solution
6	Defective sensor (the sensor is defective or disconnected).	Re-connect the sensor and verify that the compressor starts working again. Replace sensor if the compressor does not work.
5	Thermal protection of the electronic control unit. (the electronic control unit overheats if the refrigeration system has become overloaded or the environmental temperature is too high)	Remove excess gas or increase ventilation.
4	Minimum motor speed error. (if the refrigeration system has been overloaded, the motor cannot maintain minimum speed of approximately 1.850 RPM).	Remove excess gas.
3	Motor starting error [the rotor is blocked or pressure inside the refrigerant circuit is too high (> 5 bar)]. Defective electronic control unit.	The first operation to attempt is to replace the electronic control unit. Replace compressor if problem persists.
2	Fan short-circuited (the fan absorbs more than 1A from the electronic control unit).	Replace the fan.
1	Battery protection (voltage is outside the maximum and minimum voltages).	Check power cable conditions. Replace with new cables if necessary. Check battery conditions.





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8 Dimensions



Model	Width (mm) [W]	Height (mm) [H]	Depth (mm) [D]	Door Thickness (mm) [S]	Cut-Out (mm) W:H	Flange Size (mm) Left:Right:Top:Bottom	Notes
CR 36	440	250	550+135(1)	35	442:252	/:/:/	REM
CR 40 CUBE	420	430	500+90(2)	40	422:432	/:/:/	REM
CR 42 BD Micro	380	522	345+107	40	383:526	/:/:5:/	REM
CR 42 ELEGANCE	380	525	345+107	50	383:526	/:/:5:/	REM
CR 49	386	523	450	40	391:528	20:20:20:/	
CR 49 ELEGANCE	381	520	450	50	383:525	/:/:9:/	
CR 50	412	532	360+130(1)	40	416:537	/:/:10:/	REM
CR 63 FREEZER	477	620	515	40	481:625	/:/:10:/	
CR 65	455	527	480	40	460:532	20:20:20:/	
CR 65 ELEGANCE	448	527	480	50	450:532	/:/:9:/	
CR 65 FREEZER	527	610	540	40	531:615	/:/:10:/	
CR 85	477	620	505	40	481:625	/:/:10:/	
CR 85 ELEGANCE	477	620	505	50	479:625	/:/:9:/	
CR 90 FREEZER	527	746	520	40	531:751	/:/:10:/	
CR 90 BIG	478	845	430	40	482:847	/:/:/	
CR 100	487	746	455	40	491:748	/:/:/	



CR 130	527	746	505	40	531:751	/:/:10:/	
CR 130 ELEGANCE	528	746	505	50	530:751	/:/:9:/	
CR 130 DRINK	527	746	520	40	531:751	/:/:10:/	
CR 195	550	1345	580	/	555:1350	35:35:30:/	
CR 200	730	880	620	/	735:890	20:20:20:/	
CR 36 INOX	453	255	580+135(1)	/	458:260	30:30:30:30	REM
CR 63F INOX	495	620	555	/	500:625	20:20:20:/	
CR 65F INOX	545	610	580	/	550:620	20:20:20:/	
CR 90F INOX	545	743	555	/	550:748	20:20:20:/	
CR 130D INOX	545	743	560	/	550:748	20:20:20:/	
CR 160 INOX	626	870	610	/	630:870	20:20:20:/	
CR 195 INOX	545	1345	580	/	550:1350	20:20:20:/	
CR 200 INOX	730	868	620	/	735:873	20:20:20:/	
CR 320 INOX	628	1790	610	/	630:1790	20:20:20:/	

REM: the product is provided with the possibility of moving the compressor unit based on the length of the supplied hoses.

Note(1) depth that takes into account the curvature of the tube at the point of tube exit from the trunk "D"=35mm

Note(2) depth that takes into account the curvature of the tube in the case of remote control "D"=80mm (the tube is very rigid)

FOR AC/DC VERSIONS, KEEP IN MIND THAT, DUE TO LACK OF SPACE, DEPTHS EXCEEDING 50 mm WILL HAVE TO BE EVALUATED ON A CASE BY CASE BASIS.

AS PER REGULATIONS AND FOR PROPER OPERATION, THE WALLS OUTSIDE OF THE REGRIGERATOR SHOULD BE SET AT THE FOLLOWING DISTANCES FROM THE INTERNAL WALLS OF THE UNIT: 20mm ON WALLS WHERE THE COMPRESSOR IS NOT PRESENT AND 50MM ON THE WALLS WHERE THE COMPRESSOR IS PRESENT. IF THESE RULES CANNOT COMPLIED WITH, THE MINIMUM DISTANCE MEASUREMENTS MUST BE 5mm AND THE MATERIALS WITH WHICH THE WALLS ARE MADE MUST BE EXPLOSION PROOF.



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9 Warranty

The Indel Webasto Marine warranty complies with EU Directive 1999/44/EC.

Validity period

The warranty for Isotherm marine refrigerators and freezers is valid for 2 years with regard to the cost of labour for repair or replacement, but only if carried out by IWM network, and therefore authorised, service centres.

The validity period starts from:

- a) The date of sale indicated on the product invoice or sales receipt
- b) The date of the invoice or registration document of the first sale of the boat in which it is installed, if installed by the manufacturer of the vehicle
- c) In the absence of one of the above documents, the week of production indicated in the S/N (serial number)

Replacement of a product or component does not change the validity period.

The warranty covers:

- Replacement or repair of the product or of one or more components acknowledged to be faulty due to manufacturing defects.
- Breakage or malfunction of components under warranty validity despite proven proper installation and proper use.
- Labour and transport according to the operating methods described below.
- Costs for shipping the replacement product (not including charges for customs clearance).

The warranty does not cover defects, damage or malfunctions caused by:

- Negligence, neglect or improper use
- Incorrect installation or incautious handling
- Insufficient ventilation
- Incorrect electrical connection
- Undersized wiring
- Improper maintenance or maintenance performed by unauthorised personnel
- Failure to follow the instructions contained in this manual
- Transport damage
- Charges for customs clearance
- Items subject to wear, fuses etc.
- Professional use
- Damage caused by weathering

**Essential information for determining whether the case is covered by the warranty:**

- Product code (indicated on the product label)
- S/N (serial number) (indicated on the product label)
- Invoice or sales receipt (or possibly registration document, see above in Validity period section)
- Detailed description of the defect (Attach photos if possible)
- Description of installation with particular attention to ventilation and wiring (Attach photos if possible)

(If it is determined that the case is not covered under warranty, the customer must pay all expenses for repairs, replacements, labour, travel of persons and transport. IWM is not required to bear any expense.)

Operating procedures to be applied once it is ascertained that the case is covered by warranty:Refrigerators installed on boats:

Warranty repairs must be performed exclusively by service centres (CAT) that are part of the Indel Webasto Marine network. IWM does not cover costs for service performed by others. Find the service centre nearest to you at www.indelwebasto-marine.com

For products installed on boats, an IWM authorised CAT technician will come to the boat if it is located at a distance of maximum 100km from the CAT. IWM shall cover the cost of this transfer. If the boat is over 100km away, the customer can choose whether to pay the cost of the technician's transfer (in this case paying the technician directly), or to move the boat closer.

IWM does not reimburse any expense for spare parts purchased elsewhere, not of the IWM network.

Refrigerators installed on Recreational vehicles (RV):

Warranty repairs must be performed exclusively by service centres that are part of the Webasto network.

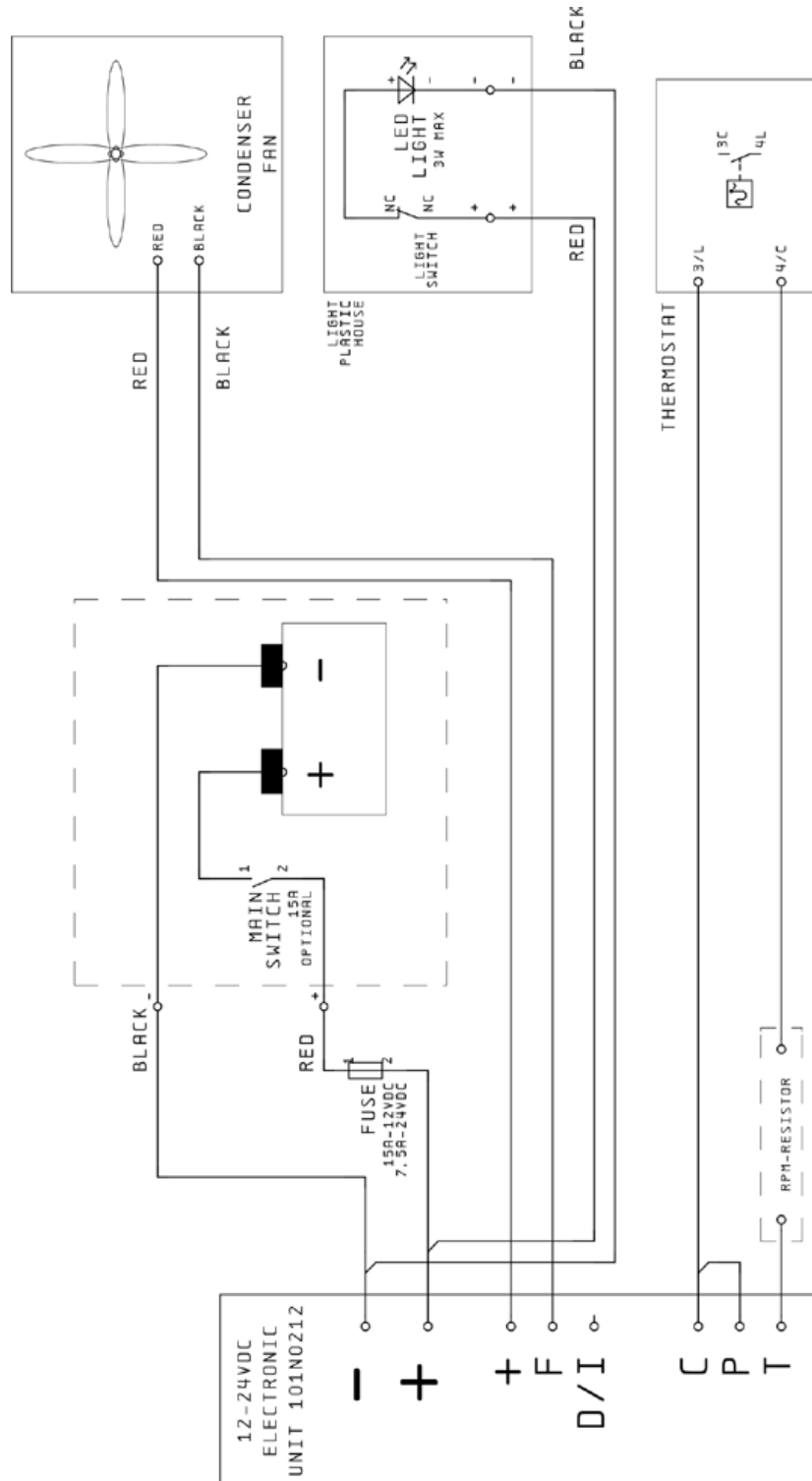
The vehicle must be brought to the service centre.

Find the service centre nearest to you at www.webasto.com



Isotherm Cruise

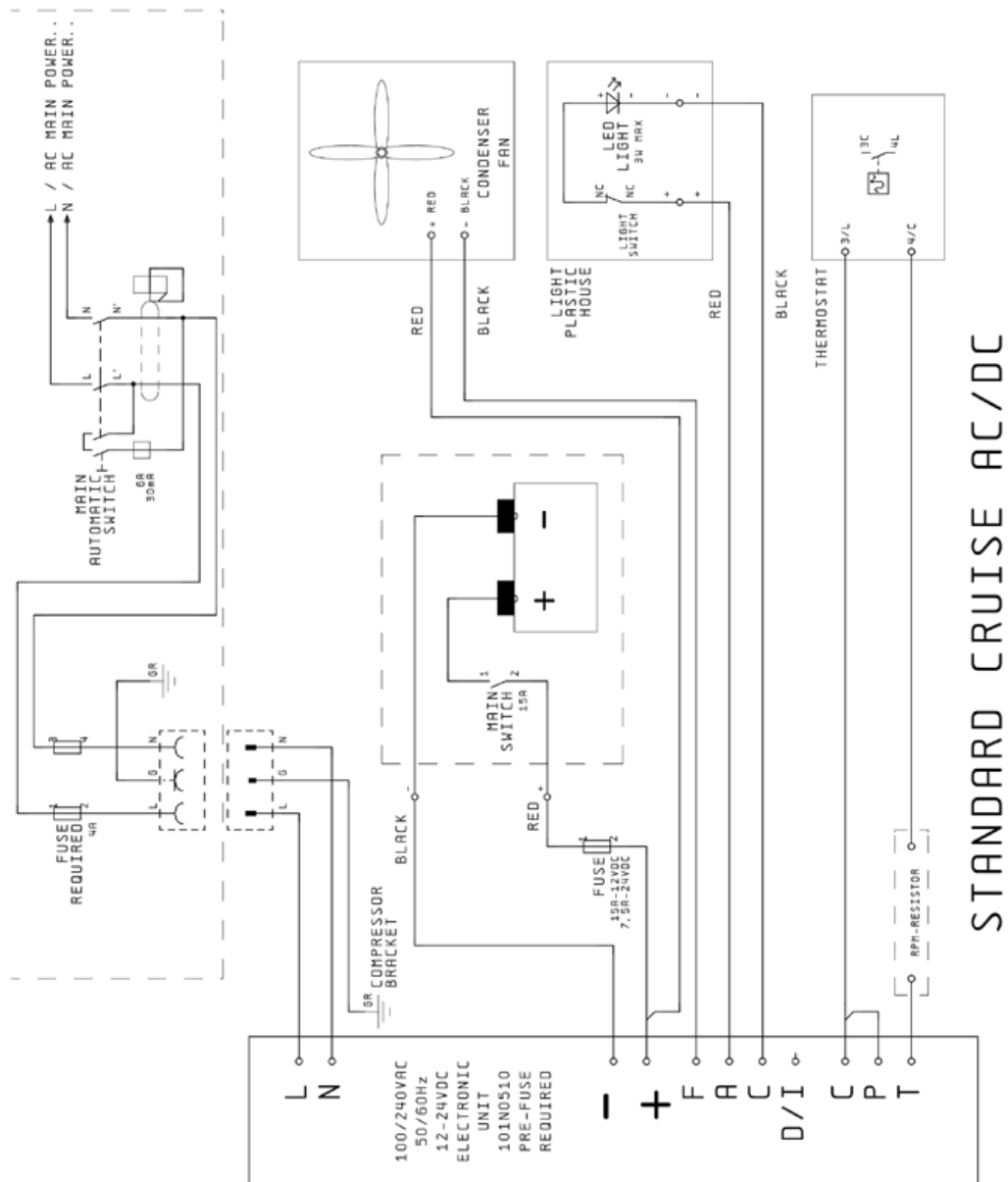
Standard Cruise DC 12/24 Volt



STANDARD CRUISE DC



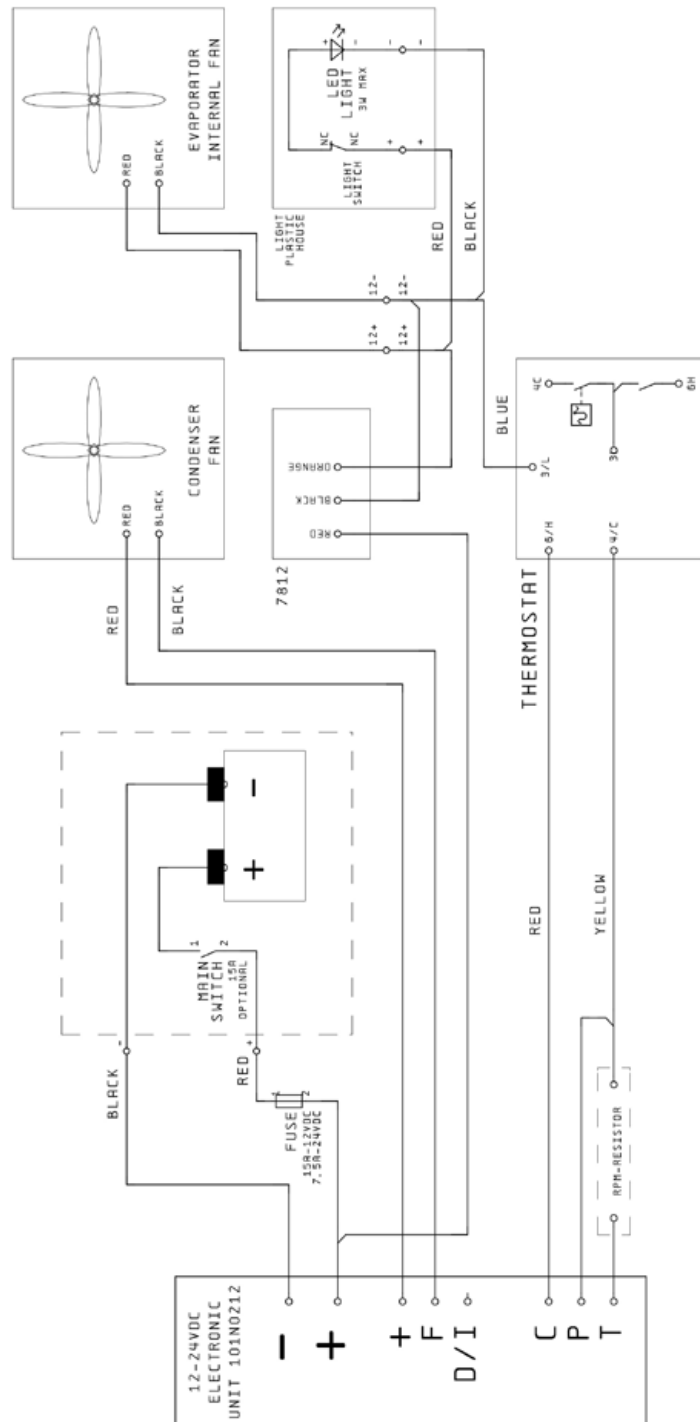
Standard Cruise AC-DC 12/24 Volt 100-240 Volt





Isotherm Cruise

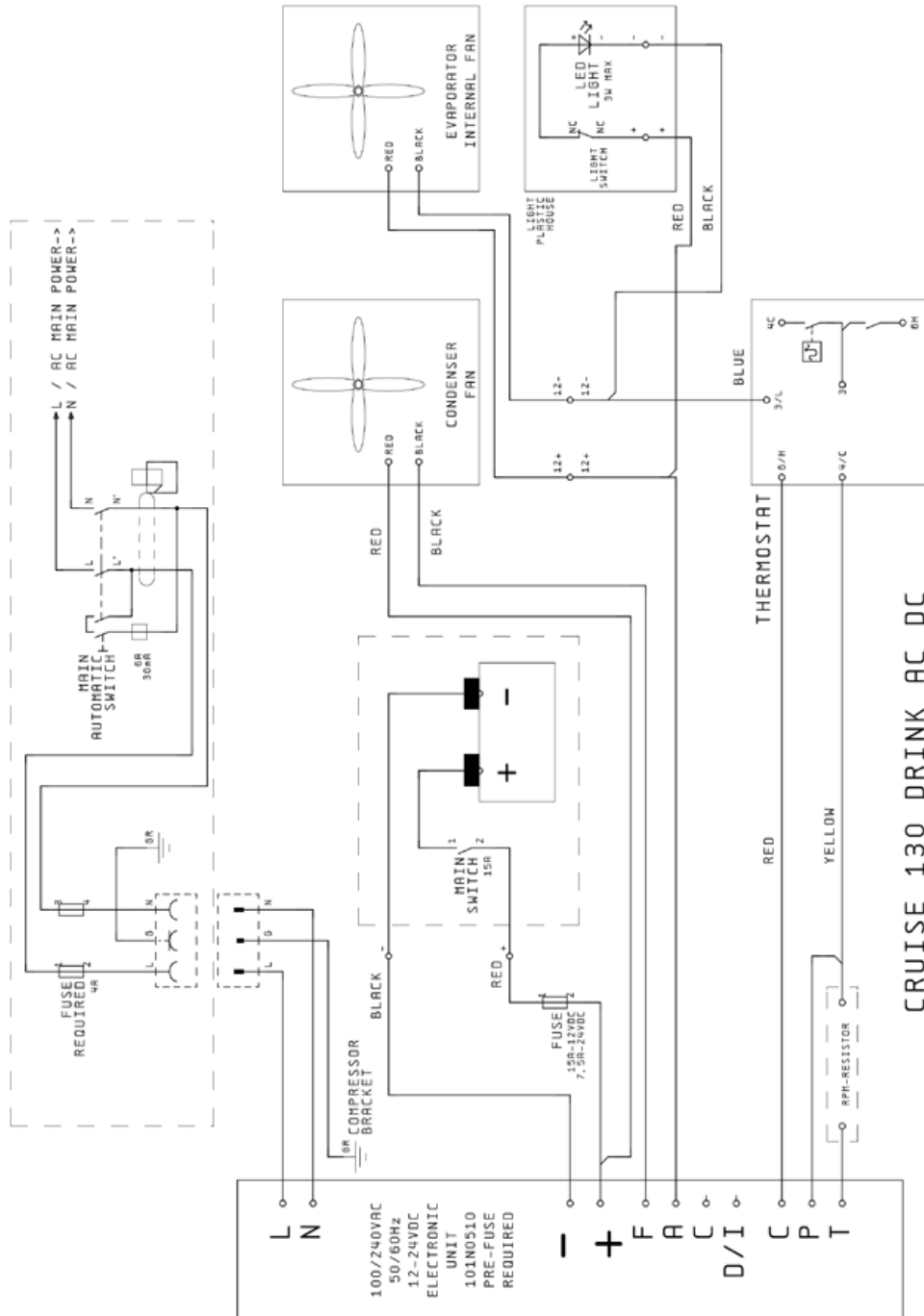
Cruise CR130 DRINK DC 12/24 Volt



CRUISE 130 DRINK DC

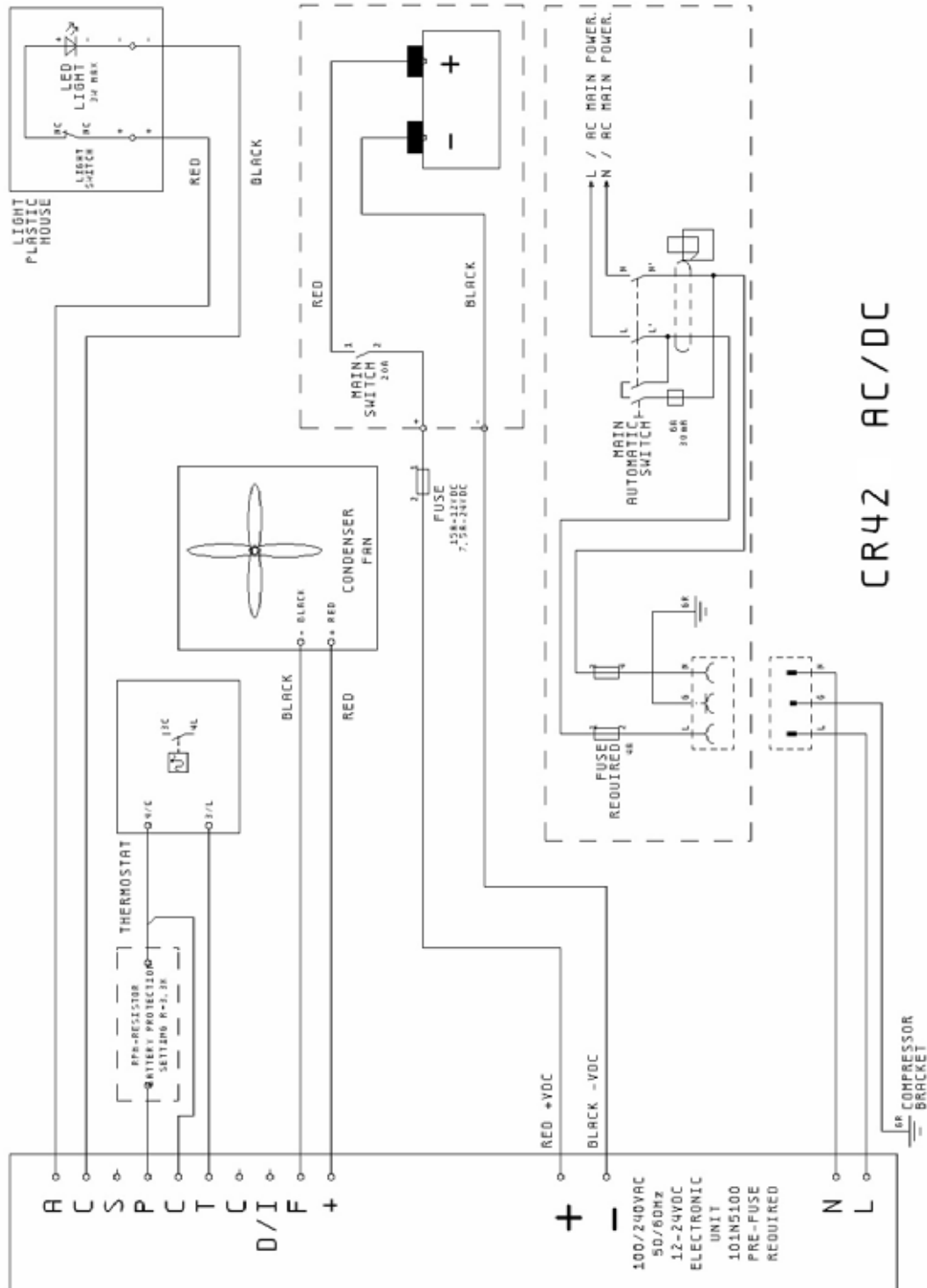


Cruise CR130 DRINK AC-DC 12/24 Volt 100-240 Volt





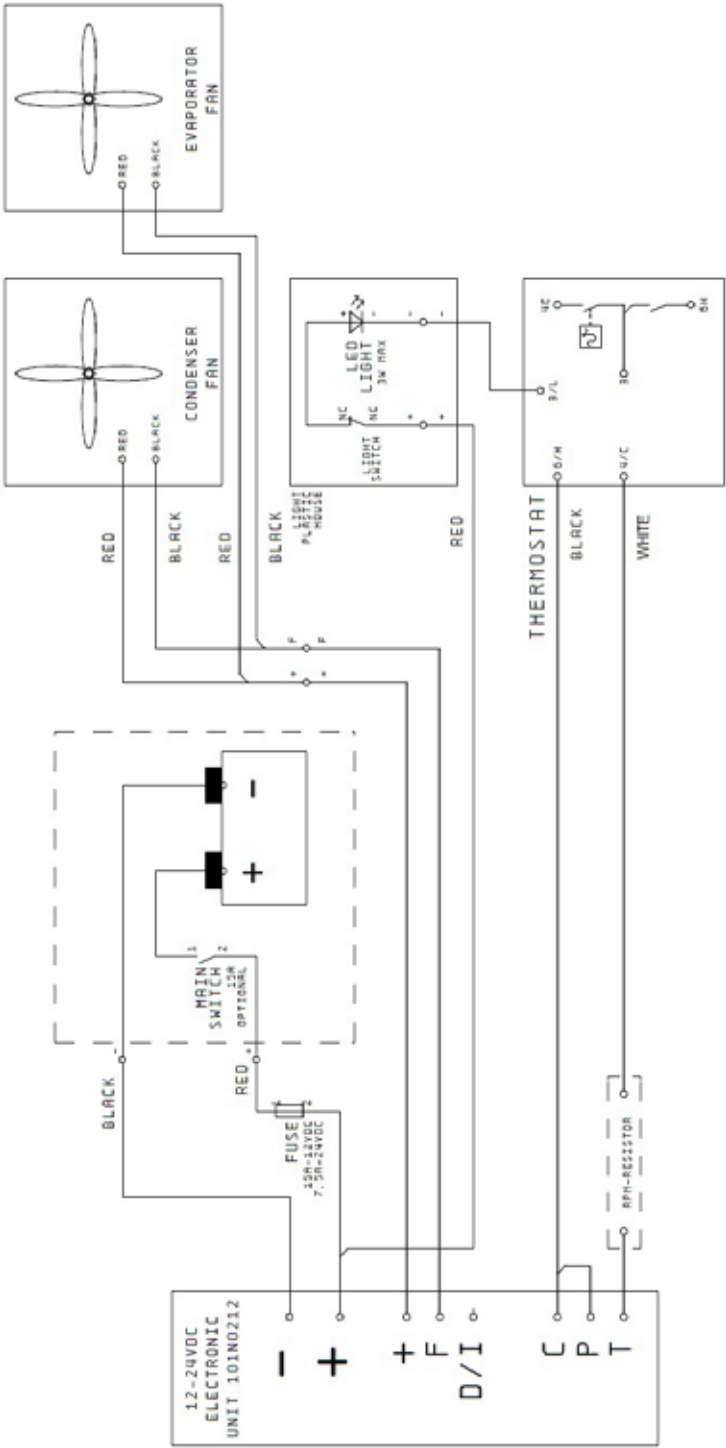
Cruise CR42C AC-DC 12/24 Volt 100-240 Volt





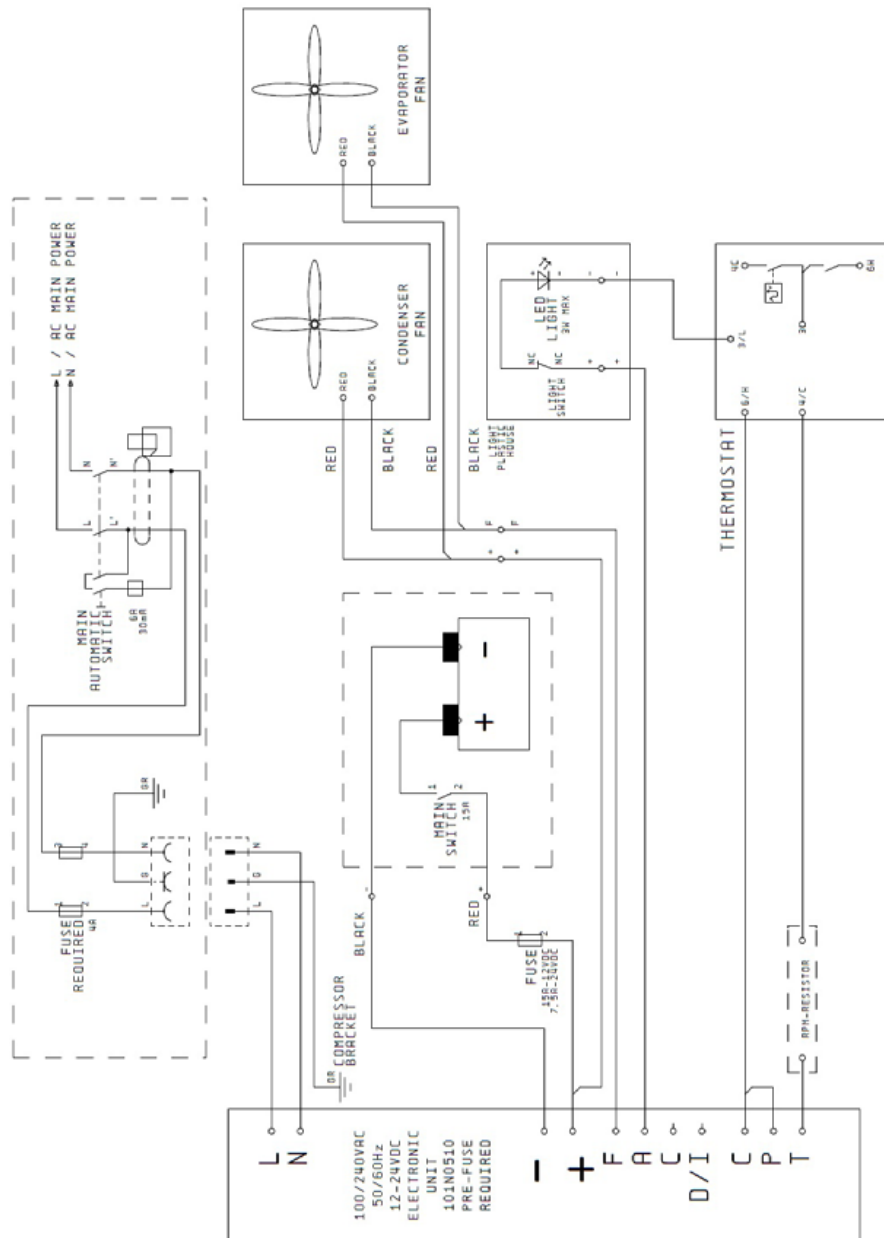
Isotherm Cruise

Cruise CR160 DC 12/24 Volt





Cruise CR160 AC-DC 12/24 Volt 100-240 Volt

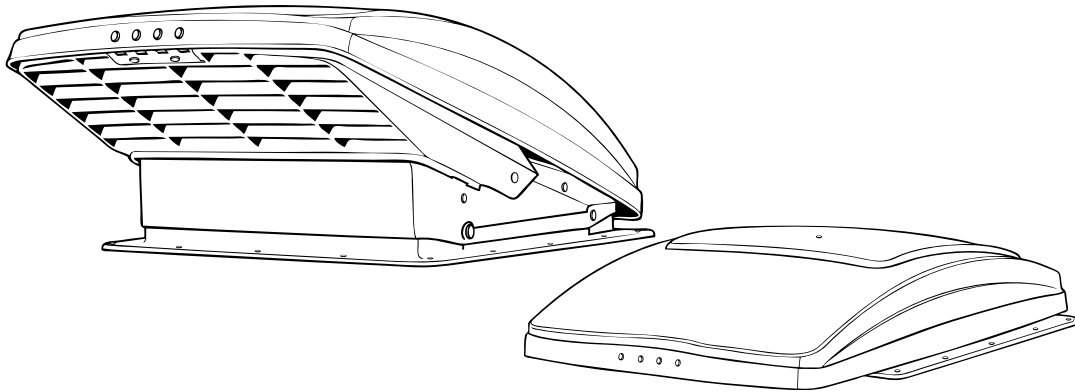




MAXXFAN[®]

INSTALLATION INSTRUCTIONS, INFORMATION AND OPERATING GUIDE

FOR ALL MAXXFAN[®] Deluxe MODELS
5100K, 5101K, 5301K, 6200K, 6201K, 6401K,
7000K, 7001K, 7500K, 7501K, 8000K, 8001K,
8500K, 8501K, 8700K, 8751K, 8900K, 8951K



READ AND SAVE THESE INSTRUCTIONS

NOTE: Refer to supplied Operating Instructions regarding the model you have purchased.

The **MAXXFAN** installs into a standard RV roof opening of 14" x 14".

To determine if your roof opening is correctly sized, simply remove the interior ceiling garnish trim ring of your existing roof vent and measure the ceiling opening or verify the opening is large enough by sliding the **MAXXFAN** interior garnish trim ring into the opening.

Due to the EXHAUST / INTAKE LOUVERS that face the rear of the vehicle, the **MAXXFAN** requires a roof area clear of obstructions such as air conditioners, storage boxes, etc. for at least 8" to the rear of the existing standard roof vent flange outer rear edge.

The **MAXXFAN** is designed for a minimum roof thickness of 1 1/8" to a maximum of 6 1/2". If your roof thickness is less than 1 1/8", build additional thickness at the ceiling opening using wood or other suitable material.

The **MAXXFAN** requires a minimum 12 Volt DC, 5 amp service. Confirm that the circuit you intend to use will accommodate the additional load. Use the proper gauge stranded wire for electrical connections.

WARNING! To reduce risk of fire, injury to persons or damage to property, use only in the manner intended by AIRXCEL, INC. Should you have questions, please contact AIRXCEL/MAXXAIR VENTILATION SOLUTIONS Customer Service at 316.832.4357.



INSTALLATION INSTRUCTIONS - ALL MODELS

STEP 1

MAXXFAN requires a roof opening of 14" x 14". If you are replacing another type already installed, remove the old existing roof vent. Remove all old roof sealant for a minimum of 2" entirely around the roof opening.

Place the **MAXXFAN** Roof Receiving Flange (reference photo #2 below) into the roof opening and trace a pencil line around it to verify the clean seal area that will be required. Note that the Roof Receiving Flange must be centered in the roof opening with the metal clips facing the sides of the vehicle (not facing the front or rear of the vehicle).

CAUTION: When installing your Roof Flange, only use a caulking/sealant compatible with the flange (plastic product) and the roof surface. **DO NOT** use materials containing solvents such as or similar to Xylene, Toluene, Methyl Ethyl Ketone, Acetate or Acetone as they can damage the flange. Also, Polysulfide (Thiokol) type sealants must be avoided. Silicone Sealants such as G.E. Silicone II (non-paintable) used for outdoor applications have proven to be suitable for this installation.

If in doubt, please contact the manufacturer of your RV for further information.

STEP 2

Apply Sealant or Caulking within the area you have traced on the roof with a pencil. Apply it carefully to avoid gaps that may allow water to enter.

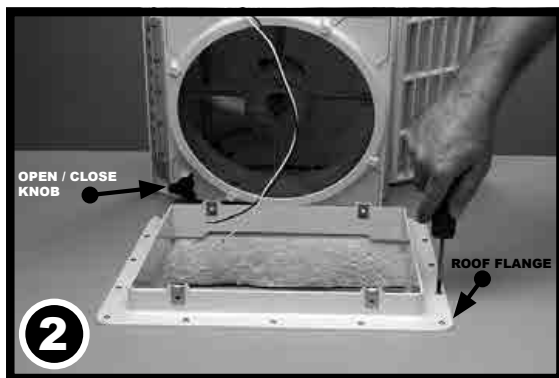
Fasten the Roof Receiving Flange to the roof with screws provided.

Apply additional roof sealant over the screw heads and around the edge of the roof flange.

CAUTION: Disconnect main vehicle power before connecting 12 volt DC power to the **MAXXFAN**!

NOTE: The **MAXXFAN** must be fully opened prior to proceeding to STEP 3. Turn knob to fully raise the vent lid.

NOTE: On the NON-REMOTE controlled models, the knob must be pulled out to unlock before turning.



STEP 3

Using the insulated electrical connectors provided, connect the vehicle's 12 volt power to the two **MAXXFAN** power wires located on the driver side of the **MAXXFAN**.

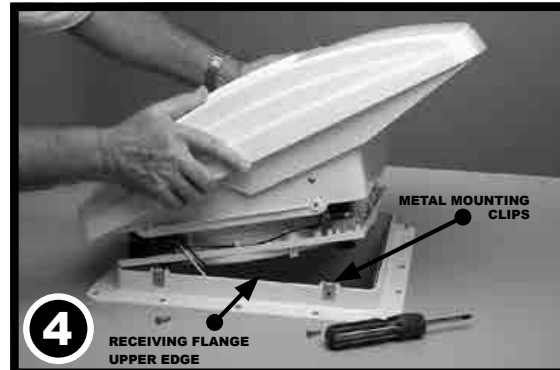
NOTE: The **MAXXFAN** black wire identified with a tag

showing (+) must be connected to the vehicle 12 volt (+) positive supply.

STEP 4

Confirm the 4 metal mounting clips are firmly in place on the Roof Receiving Flange. With the MAXXFAN open and the exhaust/intake louvers facing the rear of the vehicle, lower the MAXXFAN onto the Roof Receiving Flange.

Make sure the power wires slide to the vehicle interior and do not become entangled on the Roof Receiving Flange's upward edge.



STEP 5

Verify the MAXXFAN is fully seated down on the Roof Receiving Flange and fasten the MAXXFAN to the Roof Receiving Flange using the four 3/4" #10 stainless steel screws provided.

CAUTION: Only use the screws provided/specified for this installation or internal damage and/or insecure mounting may result.



THIS COMPLETES THE ROOF TOP PORTION OF THE INSTALLATION

NOTE: Re-apply 12 volt vehicle power. The **MAXXFAN**, excluding the 5301K and 6401K, will emit a beeping sound to indicate power is properly connected. In addition, the Remote Control model will automatically close the vent cover. If the **MAXXFAN** does not beep when power is connected, go back to step #3. Confirm that proper connections were made and 12 volt power is on and available. This **MAXXFAN** incorporates a self-resetting fuse on the circuit board located in the ceiling assembly. It can be reset by removing and re-applying power. If your fan fails to operate or needs reset, contact Customer Service at 316.832.4357 for assistance or solicit the aid of an electrical technician.

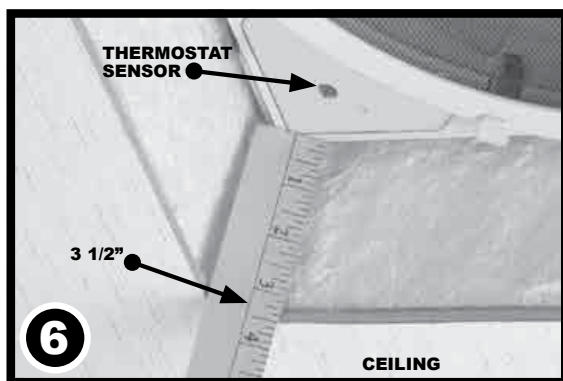


STEP 6

The interior Garnish Trim Ring must be trimmed to fit your particular RV roof thickness. To accomplish this, measure the distance from the vehicle ceiling surface to each corner of the **MAXXFAN** Control Plate.

Most RV roofs have some slope, so measuring each corner is necessary. The Garnish ring should be cut $\frac{1}{4}$ " to $\frac{1}{2}$ " longer than the dimensions measured at each corner.

In Picture #6 below, the installation measures $3\frac{1}{2}$ " from the ceiling (this is an example only) to the Control Plate. After adding $\frac{1}{2}$ " as in this example, using a ruler, place a mark at 4" on each corner of each side of the Garnish Ring (refer to 6A, right). Once marked, draw a line connecting all 4" marks on the outside of the Garnish ring and trim accordingly (refer to 6B, right).



NOTE: DO NOT probe or tamper with the thermostat sensor or IR sensor shown in illustration #6 above.



STEP 7

Complete the installation by placing any excess wiring to the inside of the roof opening and sliding the Garnish Ring into position. Fasten in place by using the four painted flat head screws provided.

CONGRATULATIONS!!!

You have successfully completed the installation of your new **MAXXFAN** Deluxe.

If you have questions, please visit AIRXCEL.com or contact Customer Service at 316.832.4357.



MEASUREMENTS STATED IN STEP 6 ARE USED AS AN EXAMPLE FOR ILLUSTRATION PURPOSES ONLY



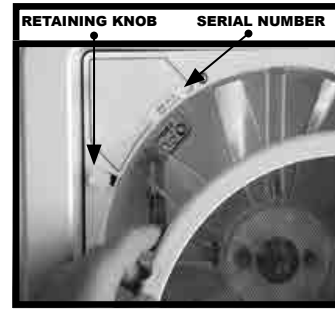
FOR REMOTE CONTROL MODELS: Refer to the Operating Instructions for use and testing of your remote control. Install two AAA batteries, follow instructions, aim remote at the ceiling unit and test your fan. The Remote Control comes with a cradle for wall mount storage of the Handheld Remote Control. Mount the cradle to your wall using the (2) #6 screws provided. Remote may be placed into the wall cradle for storage.



MAXXFAN® 2 YEAR LIMITED WARRANTY

AIRXCEL, INC. - RV PRODUCTS DIVISION / MAXXAIR VENTILATION SOLUTIONS WARRANTY:

These products are warranted to the retail consumer for two (2) years from the date of purchase against defects in material and workmanship. If the product is installed as original equipment on a vehicle, the warranty period shall begin on the date of the original purchase of the vehicle. Please have your original sales receipt and MaxxFan Serial Number readily available. If the product is installed, do not uninstall or attempt to remove and replace the product without prior authorization from RV Products Technical Department. RV Products will replace the defective repair part at no charge which includes ground shipment to the retail consumer or the service facility. This limited warranty covers parts only. No labor is covered under the terms of this warranty. This limited warranty does not cover transportation charges, costs associated with installation, removal and re-installation of the product, "Acts of God" (including but not limited to failure due to misuse, improper installation or accidental/incidental damages). Please contact RV Products direct for all warranty consideration. You may reach our Technical Department at 316-832-4357 or rvpsupport@airxcel.com for assistance. Do not return the product to your retail distributor or dealer.



We invite your comments and suggestions regarding our products. Any information you supply is for AIRXCEL / MAXXAIR's internal use and will not be shared or sold to others.

The Serial Number for your MAXXFAN is located on the back page of this booklet and on the fan control plate under the round insect screen frame. (Your serial number may or may not be located in the same position as referenced in the above image). Reference your operating guide. Rotate the four retaining knobs 180° and remove the screen to view. DO NOT OPERATE the MAXXFAN with the screen removed.

CAUTIONS AND CARE OF YOUR MAXXFAN®

This product has been manufactured using prime UV stabilized Polymers for maximum toughness and durability. However, the use of caustic or solvent based chemicals can cause cracking and product failure.

PLEASE CLEAN ALL PARTS WITH MILD SOAP AND WATER ONLY.

Do not use Petroleum Containing Additives or Solvent Based Products on any of the MAXXFAN's components or its corrosion resistant hardware.

LISTED BELOW ARE SOME KNOWN CHEMICAL PRODUCTS TO BE AWARE OF:

NON COMPATIBLE CHEMICALS - DO NOT USE THESE:

Ketones, Esters, Acetone or other like solvents, Halogenated Hydrocarbons, Amines, Aromatic Hydrocarbons, (Loctite Formulas), or any products containing references to: chemicals that are not to be used on plastics.

GENERALLY COMPATIBLE (But should be used in low concentration where possible)

Acids, Alcohol, Alkalis, Aliphatic Hydrocarbons, Mild Soap Solution (avoid strong Alkaline Material), Silicone Oil or Greases (avoid those containing Aromatic Hydrocarbons or other additives). Review the contents of your cleaning materials carefully.

*For additional information regarding your **NEW MAXXFAN®** Deluxe, please refer to the **INFORMATION AND OPERATION GUIDES***



INFORMATION AND OPERATING GUIDE

KEYPAD FOR MAXXFAN® Deluxe MODELS

5301K • 6401K

KNOB, VENT LID OPEN/CLOSE

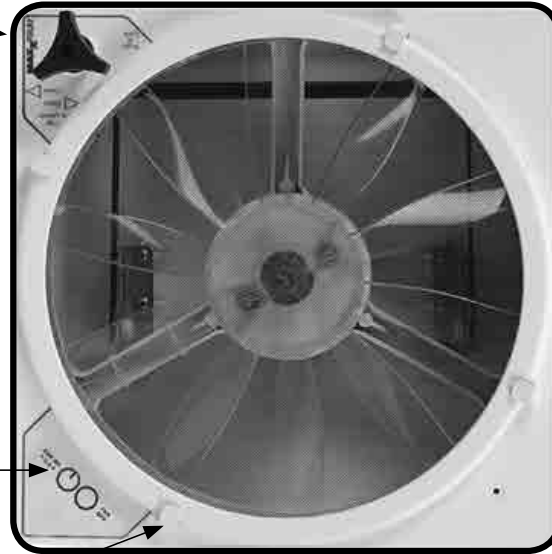
Manual Opening

Pull to unlock prior to turning. Rotate Knob clockwise to Close Vent Lid; Rotate Knob counter-clockwise to Open Vent Lid. Push "IN" to lock when Vent Lid is open or closed. It may be necessary to slightly rotate the knob to properly align it while pushing it up to lock.

Do not use excessive force when operating Knob.

KEYPAD CONTROLS

Use Keys on Keypad to control MAXXFAN functions (see descriptions below).



INSECT SCREEN RETAINER KNOB

Rotate all 4 knobs 1/2 turn to remove screen.

Caution: Never operate fan with screen removed.

CEILING FAN MODE

With the fan motor running, close the Vent Lid to enter Ceiling Fan Mode. The fan motor will continue to run and circulate air within the RV cabin.

SERIAL NUMBER LABEL

The serial number label is located underneath the round insect screen.

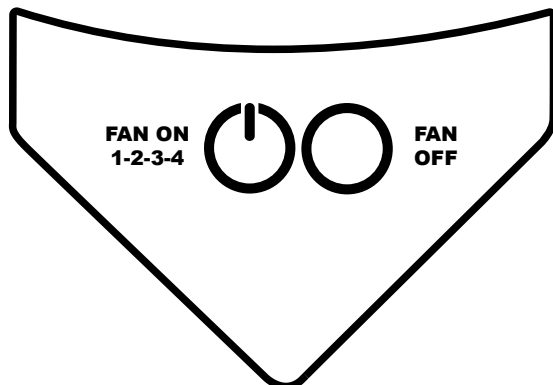
NOTE: The MAXXFAN is designed to be fully opened or fully closed when the vehicle is moving.

KEYPAD CONTROLS

KEYPAD FOR MAXXFAN® Deluxe MODELS

5301K • 6401K

CAUTION: When removing insect screen for cleaning, turn the MAXXFAN OFF and remove the vehicle 12 volt power to the MAXXFAN. When cleaning your MAXXFAN, use only a mild detergent solution.



FAN ON
1-2-3-4

Turns the Fan Motor ON to the last selected speed

When the fan is running, cycles through four (4) speeds, once **HIGH SPEED** is reached, fan motor cycles back to **LOW SPEED**



FAN OFF

Turns the Fan Motor OFF at any selected speed



FOR YOUR PARTICULAR MODEL ON THE FOLLOWING PAGES.

INFORMATION AND OPERATING GUIDE

KEYPAD FOR MAXXFAN® Deluxe MODELS

5100K, 5101K, 6200K, 6201K, 7000K, 7001K, 7500K, 7501K,
8000K, 8001K, 8500K, 8501K

KNOB, VENT LID OPEN/CLOSE

Manual Opening Models

Pull to unlock prior to turning. Rotate Knob clockwise to Close Vent Lid; Rotate Knob counter-clockwise to Open Vent Lid. Push "IN" to lock when Vent Lid is open or closed.

Automatic Opening Models

Allows closing of the vent lid in the event of RV power loss. This knob does not lock. Do not push in or pull out. Rotate knob clockwise to close vent lid; rotate knob counter-clockwise to open vent lid.

Do not use excessive force when operating Knob.

KEYPAD CONTROLS

Use Keys on Keypad to control MAXXFAN functions (see descriptions on next page).

NOTE: IR Sensor not on all models

INSECT SCREEN RETAINER KNOB

Rotate all 4 knobs 1/2 turn to remove screen.

Caution: Never operate fan with screen removed

THERMOSTAT TEMPERATURE SENSOR

CEILING FAN MODE

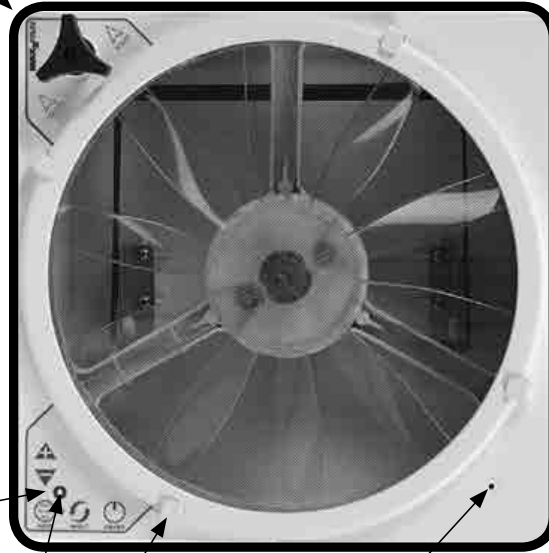
With the fan motor running, close the Vent Lid to enter Ceiling Fan Mode. The fan motor will continue to run and circulate air within the RV cabin.

SERIAL NUMBER LABEL

The serial number label is located underneath the round insect screen.

NOTE: The MAXXFAN is designed to be fully opened or fully closed when the vehicle is moving.

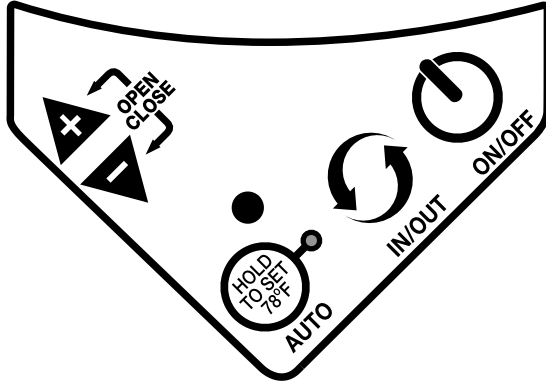
CAUTION: When removing screen for cleaning, turn the MAXXFAN OFF and remove the vehicle 12 volt power to the MAXXFAN. When cleaning your MAXXFAN, use only a mild detergent solution.





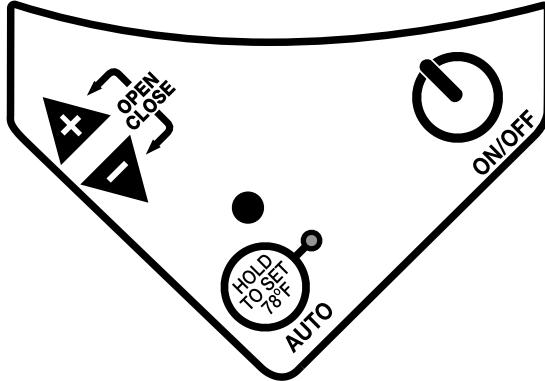
KEYPAD CONTROLS

**KEYPAD FOR
MAXXFAN® Deluxe
INTAKE/EXHAUST MODELS
5100K, 6200K, 7000K, 7500K,
8000K, 8500K**



KEYPAD CONTROLS

**KEYPAD FOR
MAXXFAN® Deluxe
EXHAUST ONLY MODELS
5101K, 6201K, 7001K, 7501K
8001K, 8501K**



NOTE: A beeping sound will confirm each key press



ON/OFF

ON/OFF: Use this key to start the fan or to turn off the fan. On Automatic Opening Models the lid will also open or close when the fan is turned on or off. On Manual Opening Models pushing this key while in Auto Mode will exit Auto Mode, turn off the fan and the lid will stay in the position you selected. On Automatic Opening Models this button will exit Auto mode, turn the fan off, and close the lid.



IN/OUT

IN/OUT: Use this key to reverse the direction of the fan, the fan will slow down and pause for two (2) seconds before resuming operation in the opposite direction. **Note:** In Auto Mode the fan direction is automatically positioned to Exhaust, but may be overridden and changed to Intake by depressing this key. **PLEASE NOTE: THIS KEY HAS BEEN REMOVED ON EXHAUST ONLY MODELS**



AUTO

AUTO: Auto Mode allows the thermostat to turn the fan **ON and OFF** depending on the thermostat setting. Press this key once for less than three (3) seconds to enter Auto Mode, three (3) quick beeps will confirm the MAXXFAN has entered Auto Mode. To EXIT Auto Mode, press the **ON/OFF** key. Initial factory set point for the thermostat is 78°F/25°C. The green LED will light to indicate the MAXXFAN is in Auto Mode. To adjust, follow instructions below: If no previous thermostat temperature was entered, or you wish to change a previous set temperature, press the HOLD TO SET key for more than 3 seconds and you will hear one long beep and the thermostat will be reset to 78°F. To further adjust the set temperature, if desired, use the (+) or (-) Arrow keys to adjust at 1° increments per press. The fan will emit a beeping sound to confirm this setting. If a previous thermostat temperature was entered, the fan will remember this temperature setting and the next time you enter Auto Mode, the fan will start ventilating automatically as directed by the thermostat. The fan speed will automatically adjust based on the cabin temperature. As cabin temperature rises, the fan increases in speed. **Note:** If 12 volt RV power is removed from the MAXXFAN, the thermostat will be reset to 78°F/25°C.



ARROW - When in Auto Mode: Use the (+) & (-) Arrow keys to adjust the thermostat set temperature up or down in 1° increments per press.

When in Manual Mode: Use the (+) & (-) Arrow keys to adjust the fan speed up or down. When the fan speed reaches either the maximum or minimum speed, the fan will respond with 2 quick beeps to indicate this.

ARROW KEYS PRESSED TOGETHER: *Automatic Lift Models Only*

Press the (+) & (-) Arrow keys at the same time to Open or Close the lid. The fan motor will remain in its current state.



REMOTE CONTROL OPERATING GUIDE

WIRELESS REMOTE CONTROL FOR

MAXXFAN® Deluxe MODELS 7000K • 7500K

Optional for 8000K, 8500K, 8700K, 8900K Models



**FAN
ON/OFF**

FAN ON & POWER OFF - Press this button:

- To start the fan
- To turn the fan off
- To exit Auto Mode



VENT LID POSITION - Press this button to open or close the vent lid

- While the fan is running in Manual Mode press once to close the vent lid and enter "Ceiling Fan" Mode.

NOTE: This button is not active in Auto Mode. If the fan loses 12volt RV power or power is removed from the fan, use the knob located at the ceiling to manually open or close the vent lid if desired.



AIR EXHAUST / INTAKE - Press this button to reverse the fan from intake or exhaust

NOTE: In Auto Mode, the fan direction is automatically positioned to Exhaust, but may be overridden and changed to Intake by depressing this key.



FAN AUTO MODE - Press this button to enter Auto Mode

- Auto Mode allows the fan lid to automatically open and the fan motor to operate as dictated by the thermostat set point temperature. Once the cabin temperature cools and reaches the set point temperature, the fan lid will close and the fan motor will shut off.
- Pressing this button while in Auto Mode will shut off Auto Mode, close the vent lid and shut off the fan motor.



THERMOSTAT SET TEMPERATURE

TEMP + ~ Press this button to increase the Set Temperature for Auto Mode.

TEMP - ~ Press this button to decrease the Set Temperature for Auto Mode.

NOTE: The thermostat temperature range is from 29°F to 99°F or -2°C to 37°C. To change from Fahrenheit to Celsius on the temperature display, press and hold both set temperature keys simultaneously.



FAN SPEED

Fan Speed + ~ Press this button to increase the fan speed. The fan has ten speeds.

Fan Speed - ~ Press this button to decrease the fan speed. The fan has ten speeds.

NOTE: When the fan speed reaches either the maximum or minimum speed, the fan will respond with 2 quick beep sounds to indicate this.



LOW BATTERY INDICATOR

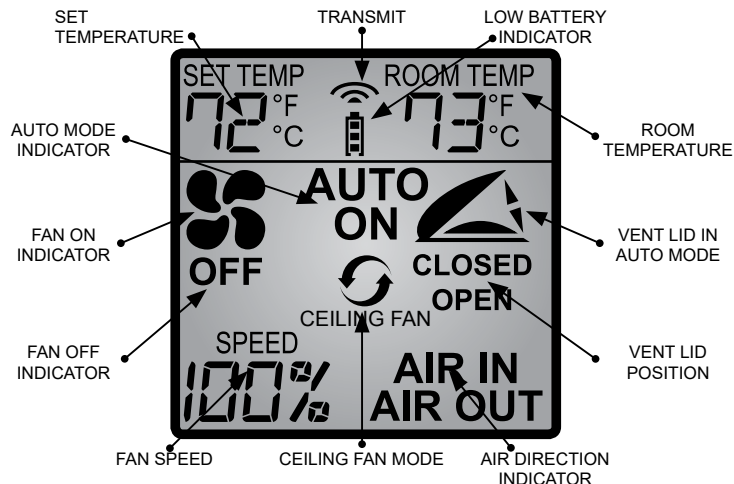
- When the battery is at full charge, three black power bars are displayed.
- One or zero power bars displayed indicates the batteries need replacement.



TRANSMISSION SIGNAL

- This symbol is displayed on the screen when any button is pressed to indicate the signal was transmitted to the fan.
- A beep sound from the ceiling unit indicates the signal from the remote control was received by the fan.

Remove protective film from Display Screen





REMOTE CONTROL OPERATING GUIDE

WIRELESS REMOTE CONTROL FOR

MAXXFAN® Deluxe MODELS 7001K • 7501K

Optional for 8001K, 8501K Models



FAN ON & POWER OFF - Press this button:

- To start the fan
- To turn the fan off
- To exit Auto Mode



VENT LID POSITION - Press this button to open or close the vent lid

- While the fan is running in Manual Mode press once to close the vent lid and enter "Ceiling Fan" Mode.

NOTE: This button is not active in Auto Mode. If the fan loses 12volt RV power or power is removed from the fan, use the knob located at the ceiling to manually open or close the vent lid if desired.



FAN AUTO MODE - Press this button to enter Auto Mode

- Auto Mode allows the fan lid to automatically open and the fan motor to operate as dictated by the thermostat set point temperature. Once the cabin temperature cools and reaches the set point temperature, the fan lid will close and the fan motor will shut off.
- Pressing this button while in Auto Mode will shut off Auto Mode, close the vent lid and shut off the fan motor.



THERMOSTAT SET TEMPERATURE

TEMP + ~ Press this button to increase the Set Temperature for Auto Mode.

TEMP - ~ Press this button to decrease the Set Temperature for Auto Mode.

NOTE: The thermostat temperature range is from 29°F to 99°F or -2°C to 37°C. To change from Fahrenheit to Celsius on the temperature display, press and hold both set temperature keys simultaneously.



FAN SPEED

Fan Speed + ~ Press this button to increase the fan speed. The fan has ten speeds.

Fan Speed - ~ Press this button to decrease the fan speed. The fan has ten speeds.

NOTE: When the fan speed reaches either the maximum or minimum speed, the fan will respond with 2 quick beep sounds to indicate this.



LOW BATTERY INDICATOR

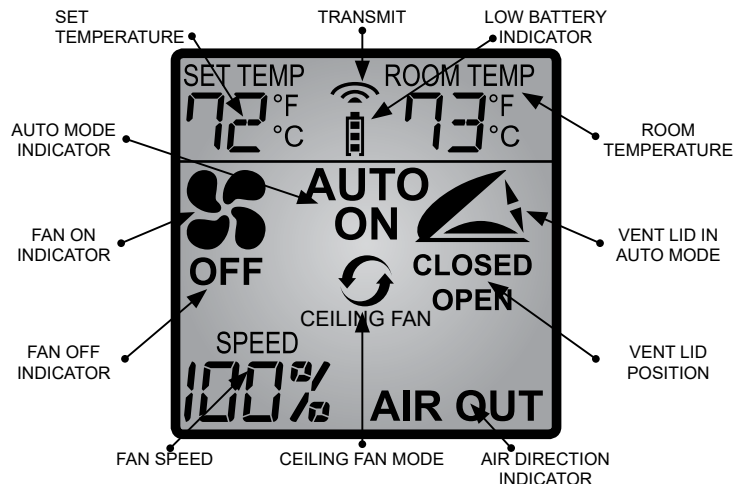
- When the battery is at full charge, three black power bars are displayed.
- One or zero power bars displayed indicates the batteries need replacement.



TRANSMISSION SIGNAL

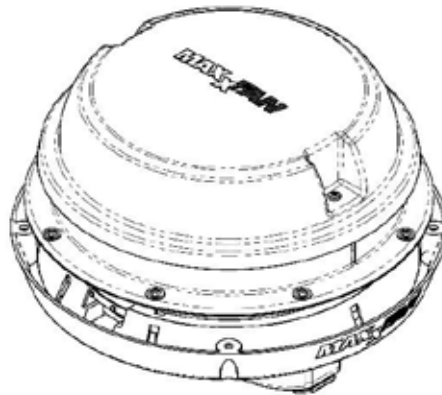
- This symbol is displayed on the screen when any button is pressed to indicate the signal was transmitted to the fan.
- A beep sound from the ceiling unit indicates the signal from the remote control was received by the fan.

Remove protective film from Display Screen





MAXXFAN DOME INSTALLATION INSTRUCTIONS, INFORMATION AND OPERATING GUIDE FOR MODELS 3810, 3812



READ AND SAVE THESE INSTRUCTIONS

NOTE: Refer to Installation Instructions, Information and Operation Guides regarding the model you have purchased.

The **MAXXFAN Dome** fan is an exhaust fan only.

The **MAXXFAN Dome** fan installs into a 6 1/4 inch diameter opening.

To determine if your roof opening is correctly sized, simply remove the interior ceiling garnish trim ring of your existing roof vent and measure the ceiling opening or verify the opening is large enough by sliding the **MAXXFAN Dome** sleeve into the opening.

The **MAXXFAN Dome** is designed for a minimum roof thickness of 1 inch to a maximum of 6 inches.

The **MAXXFAN Dome** fan requires a minimum 12 Volt DC, 2 amp service. Confirm that the circuit you intend to use will accommodate the additional load. Circuit must be fused and use appropriate gauge stranded wire for electrical connections.

WARNING! TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:

- a) Use this unit in the manner intended by AIRXCEL, INC. If you have questions, contact the manufacturer.
- b) Before servicing or cleaning unit, switch power off at service panel and lock the service disconnecting means to prevent power from being switched on accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.

CAUTION! FOR GENERAL VENTILATION USE ONLY. DO NOT USE TO EXHAUST HAZARDOUS OR EXPLOSIVE MATERIALS AND VAPORS.



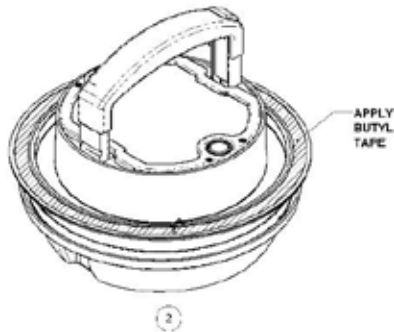
INSTALLATION INSTRUCTIONS

WARNING! TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:

Installation work and electrical wiring must be done by qualified persons(s) in accordance with all applicable codes and standards, including fire-rated construction.

STEP 1

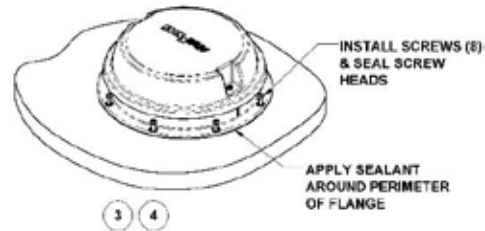
The MAXXFAN Dome fan requires a minimum 6 1/4 inch diameter roof opening. If you are replacing another type already installed, remove the old existing roof vent. Remove all old roof sealant for a minimum of 2" entirely around the roof opening.



STEP 2

Prior to installing the MAXXFAN Dome in the roof opening, apply a continuous strip of BUTYL tape or equivalent to the underside of the flange in the groove provided.

CAUTION! When installing your MAXXFAN Dome fan, only use a caulking/sealant compatible with the flange (plastic product) and the roof surface. DO NOT use materials containing solvents such as or similar to Xylene, Toluene, Methyl Ethyl Ketone (MEK), Acetate or Acetone as they can damage the flange. Also, Polysulfide (Thiokol) type sealants must be avoided. If in doubt, please contact the manufacturer of your RV.



STEP 3

When inserting the MAXXFAN Dome fan into the roof opening:

- orient the fan with the button toward the front of the coach.
- ensure that the fan wires are hanging to the inside of the coach.

Center the fan in the opening.

Using the eight (8) screws provided, attach the flange to the roof at each dimple location along the flange.

Note: Opening the fan lid gives better access to the flange for assembling the screws.

Screw into the dimple to pierce the flange, making sure not to overtighten the screws to avoid cracking the flange.

STEP 4

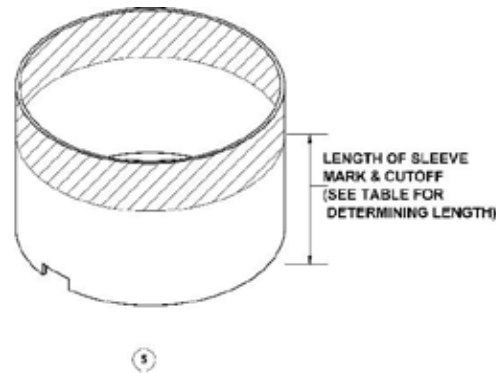
After the MAXXFAN Dome fan has been installed, remove the excess BUTYL caulk that may have squeezed out. Using a sealer such as Dicor self-leveling lap sealant or similar caulking, apply a daub over every exposed screw head. In addition, apply a bead (approximately 3/16" dia.) along the outside edge of the flange all the way around the fan.

THIS COMPLETES THE ROOF TOP PORTION OF THE INSTALLATION



CAUTION! Disconnect main vehicle power before connecting 12 volt DC power to the **MAXXFAN Dome** exhaust fan.

STEP 5



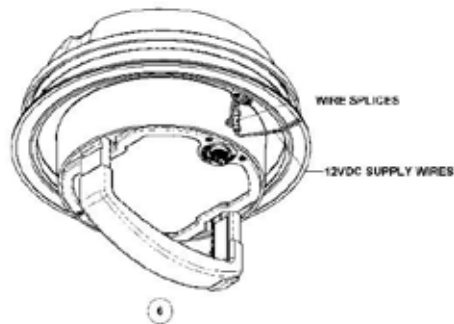
- If the roof is thicker than 1 inch the extension sleeve must be used.
- A roof that is 6 inches thick will use the full-length extension sleeve without trimming.

VEHICLE ROOF THICKNESS	SLEEVE LENGTH TO CUTOFF	
	LED	NON-LED
6.0	NONE (use full length sleeve)	NONE (use full length sleeve)
1.0 inch	Not Applicable, Sleeve not used	Not Applicable, Sleeve not used

- If the roof is between 1 inch and 6 inches, the extension sleeve may need to be trimmed.
- Measure the distance from the vehicle ceiling to the base of the MAXXFAN Dome fan. Cut the extension sleeve longer than the dimension measured to accommodate the depth of the garnish ring. Refer to table below for additional length required.

NOTE: Mark and cut the extension sleeve per figure 5 shown above.

VEHICLE ROOF THICKNESS	LENGTH TO ADD TO CEILING THICKNESS MEASUREMENT	
	LED	NON-LED
1 1/8 to 5 7/8 inch	15/16 inch	1/2 inch



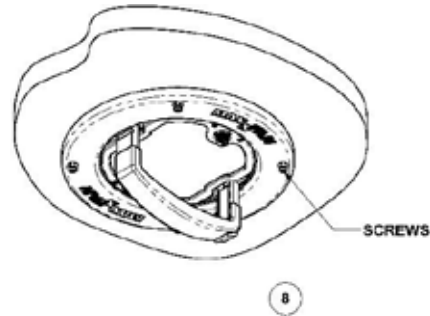
STEP 6 Non-LED MAXXFAN Dome

Using the supplied wire splices, connect the Positive (+) 12VDC supply wire to the **MAXXFAN Dome** fan wire marked "POS 12VDC" and the Negative (-) 12VDC supply wire to the **MAXXFAN Dome** fan wire marked "Neg. 12VDC".

- If the sleeve is needed, insert the sleeve into the garnish ring positioning the notch in the sleeve to line up the wiring.
- Raise the garnish ring to the ceiling ensuring that the garnish ring is centered over the fan opening.
- If using the sleeve, the sleeve will overlap the base that extends in the

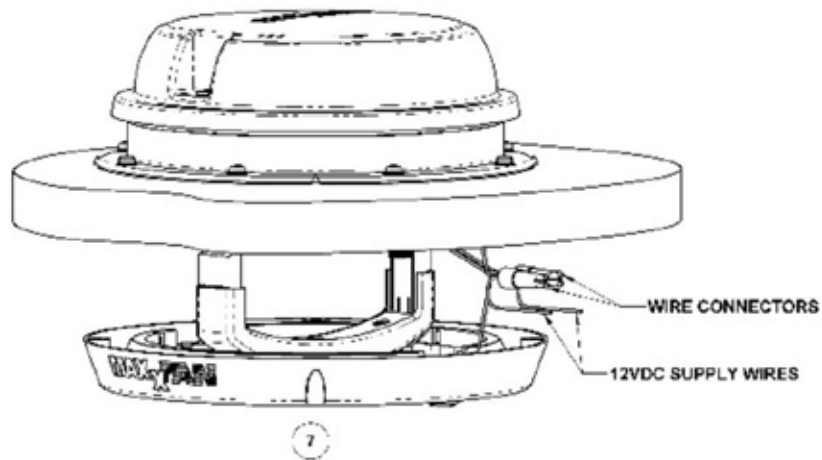
opening. This will help center the garnish ring in the opening.

- Ensure that the wires are not pinched. The wires should be routed on the outside of the sleeve. The excess wire should lay in the garnish ring to keep them contained.



- Secure the garnish ring to the ceiling with the four (4) screws provided in the small parts package.
- Reconnect the main vehicle power to the **MAXXFAN Dome**.

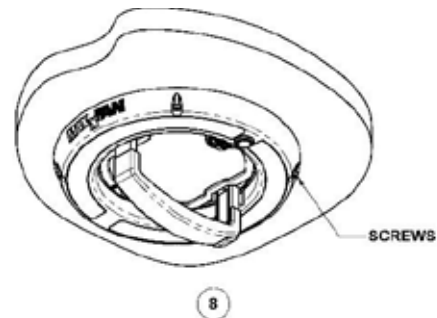
This completes the installation of the MAXXFAN Dome exhaust fan.



STEP 7 LED MAXXFAN Dome

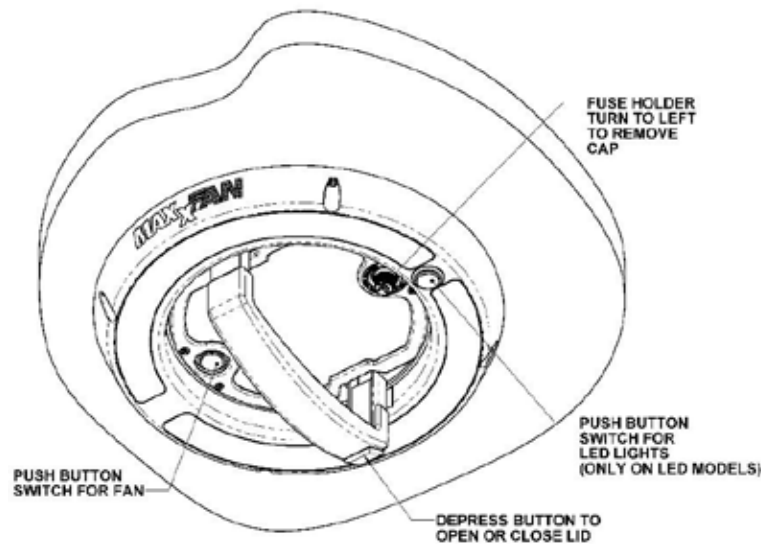
Using the supplied wire nuts, connect the Positive (+) 12VDC supply wire to the **MAXXFAN Dome** fan wire and the LED light wire marked "POS 12VDC" and the Negative (-) 12VDC supply wire to the **MAXXFAN Dome** fan wire and the LED light wire marked "Neg. 12VDC".

- If the sleeve is needed, insert the sleeve into the garnish ring positioning the notch in the sleeve to line up the wiring.
- Raise the garnish ring to the ceiling ensuring that the garnish ring is centered over the fan opening.
- If using the sleeve, the sleeve will overlap the base that extends in the opening. This will help center the garnish ring in the opening.
- Ensure that the wires are not pinched. The wires should be routed on the outside of the sleeve. The excess wire and wire nuts should lay in the garnish ring to keep them contained.



- Secure the garnish ring to the ceiling with the four (4) screws provided in the small parts package.
- Reconnect the main vehicle power to the **MAXXFAN Dome**.

This completes the installation of the MAXXFAN Dome fan.



OPERATION OF YOUR MAXXFAN Dome fan

- To open the MAXXFAN Dome lid push the button on the handle to dis-engage the clip and slide the handle up till the clip engages the upper opening.
- To close the lid, push the button on the handle to dis-engage the clip and pull the handle down till the clip engages the lower opening.
- Operation of your **MAXXFAN Dome** simply entails pushing the ON/OFF button on the fan to activate the exhaust fan.
- The optional LED lighting on the garnish ring is operated by the push button on the garnish ring. The LED lighting and fan operate independently
- Close the lid to impede infiltration of air when exhaust fan is not in use.
- The MAXXFAN Dome fan should not be operated with the lid closed.

USER INSTRUCTIONS SERVICING

Cleaning of your **MAXXFAN Dome** may be achieved with mild soap and water only. The screen can be removed for cleaning by removing the four (4) screws.

Before removing the screen for cleaning, ensure the fan is turned to the OFF position.

CAUTION: Do not operate the fan with the screen removed.

The **MAXXFAN Dome** fan has a 5 amp fuse. To access the fuse, turn the fuse cap to the left to remove the cap. Replace the fuse with a 5 amp, type GMA fast acting fuse. Replace the fuse cap to secure the fuse in the fuse holder.

Should you have questions, please contact AIRXCEL / MAXXAIR VENTILATION SOLUTIONS Customer Service at 316.832.4357.

For WARRANTY information, please visit www.airxcel.com/maxxair.



For additional product information please visit www.AIRXCEL.com

AIRCEL, INC. – RV Products Division / MAXXAIR
3050 N. St. Francis St. • Wichita, KS 67219 • 316.832.3400



Microwave Oven

INSTRUCTION MANUAL

Model:EM925AQR

PRECAUTIONS TO AVOID POSSIBLE EXPOSURE TO EXCESSIVE MICROWAVE ENERGY

- (a) Do not attempt to operate this oven with the door open since this can result in harmful exposure to microwave energy. It is important not to break or tamper with the safety interlocks.
- (b) Do not place any object between the oven front face and the door or allow soil or cleaner residue to accumulate on sealing surfaces.
- (c) **Do not operate the oven if it is damaged. It is particularly important that the oven door closes properly and that there is no damage to the:**
 - (1) **DOOR (bent)**
 - (2) **HINGES AND LATCHES (broken or loosened)**
 - (3) **DOOR SEALS AND SEALING SURFACE**
- (d) **The oven should not be adjusted or repaired by anyone except properly qualified service personnel.**

ADDENDUM

If the apparatus is not maintained in a good state of cleanliness, its surface could be degraded and affect the lifespan of the apparatus and lead to a dangerous situation.

Specifications

Model:	EM925AQR
Rated Voltage:	120V~ 60Hz
Rated Input Power(Microwave):	1350W
Rated Output Power(Microwave):	900W
Oven Capacity:	1.0 Cu.ft.
Turntable Diameter:	Ø 10.6 inch
External Dimensions:	19.1X14.8X11.5 inch
Net Weight:	Approx.28.2 Lbs
Warning:	Handling the cord on this press or cords associated with accessories sold with this product, will expose you to lead a chemical known to the state of California to cause cancer, and birth defects or other reproductive harm. Wash hands after handling.

SAFETY

1. The oven must be on a level surface.
2. The turntable and turntable roller rest must be in the oven during cooking. Place the cookware gently on the turntable and handle it carefully to avoid possible breakage.
3. Incorrect use of browning dish may cause the turntable to break.
4. Use only the specified bag size when using Popcorn.
5. The oven has several built-in safety switches to ensure that the power remains off when the door is open. Do not tamper with these switches.
6. Do not operate the microwave oven empty. Operating the oven with no food or food that is extremely low in moisture can cause fire, charring or sparking.
7. Do not cook bacon directly on the turntable. Excessive heating of the turntable may cause the turntable to break.
8. Do not heat baby bottles or baby food in the microwave oven. Uneven heating may occur and could cause physical injury.
9. Do not heat narrow-necked containers, such as syrup bottles.
10. Do not attempt to deep-fry in your microwave oven.
11. Do not attempt home canning in this microwave oven, as it is impossible to be sure all contents of the jar have reached boiling temperature.
12. Do not use this microwave oven for commercial purposes. This microwave oven is made for household use only.
13. To prevent delayed eruptive boiling of hot liquids and beverages or scalding yourself, stir liquid before placing the container in the oven and again halfway through cooking time. Let stand in the oven for a short time and stir again before removing the container.
14. Use carefully when cooking food in the microwave oven to avoid burning due to excessive cooking.
15. Failure to maintain the oven in a clean condition could lead to deterioration that could adversely affect the life of the appliance and possibly result in a hazardous situation.

Radio Interference

1. Operation of the microwave oven may cause interference to your radio, TV or similar equipment.
2. When there is interference, it may be reduced or eliminated by taking the following measures:
 - 1) Clean door and sealing surface of the oven
 - 2) Reorient the receiving antenna of radio or television.
 - 3) Relocate the microwave oven with respect to the receiver.
 - 4) Move the microwave oven away from the receiver.
 - 5) Plug the microwave oven into a different outlet so that microwave oven and receiver are on different branch circuits.



IMPORTANT SAFETY INSTRUCTIONS

WARNING

To reduce the risk of fire, electric shock, injury to persons or exposure to excessive microwave oven energy when using your appliance, follow basic precautions, including the following:

1. Read all instructions before using the appliance.
2. Read and follow the specific: **"PRECAUTIONS TO AVOID POSSIBLE EXPOSURE TO EXCESSIVE MICROWAVE ENERGY" on page 2.**
3. As with most cooking appliances, close supervision is necessary to reduce the risk of a fire in the oven cavity.
If materials inside the oven ignite:
 1. Keep the oven door closed.
 2. Turn the oven off, and unplug the appliance.
 3. Disconnect the power cord, shut off power at the fuse or circuit breaker panel.
 4. Do not overcook food. Carefully attend the appliance when paper, plastic, or other combustible materials are placed inside the oven to facilitate cooking.
 5. Do not use the oven cavity for storage purposes. Do not store combustible items such as bread, cookies, paper products, etc. inside the oven.
 6. Remove wire twist-ties and metal handles from paper or plastic containers/bags before placing them in the oven.
 7. This oven must be grounded. Connect only to properly grounded outlet. See **"GROUNDING INSTRUCTIONS" on page 5.**
 8. Install or locate this oven only in accordance with the installation instructions provided.
 9. Some products such as whole eggs, water with oil or fat, sealed to explode and therefore should not be heated in this oven.
10. Use this appliance only for its intended uses as described in this manual. Do not use corrosive chemicals or vapors in this appliance. This oven is specifically designed to heat or cook food. It is not designed for industrial or laboratory use.
11. As with any appliance, close supervision is necessary when used by children.
12. Do not operate this oven if it has a damaged cord or plug, if it is not working properly or if it has been damaged or dropped.
13. This appliance should be serviced only by qualified service technicians. Contact the nearest authorized service facility for examination, repair or adjustment.
14. Do not cover or block any vents on the oven.
15. Do not store or use this appliance outdoors.
16. Do not use this oven near water, for example, near a kitchen sink, in a wet basement, near a swimming pool, or similar locations.
17. Do not immerse cord or plug in water.
18. Keep cord away from heated surfaces.
19. Do not let cord hang over edge of table or counter.
20. When cleaning door and oven surfaces use only mild, nonabrasive soaps or detergents applied with a sponge or soft cloth.

21. Liquids, such as water, coffee, or tea are able to be overheated beyond the boiling point without appearing to be boiling. Visible bubbling or boiling when the container is removed from the microwave oven is not always present. THIS COULD RESULT IN VERY HOT LIQUIDS SUDDENLY BOILING OVER WHEN THE CONTAINER IS DISTURBED OR A SPOON OR OTHER UTENSIL IS INSERTED INTO THE LIQUID.
- i) Do not overheat the liquid.
 - ii) Stir the liquid both before and halfway through heating it.
 - iii) Do not use straight-sided containers with narrow necks.
 - iv) After heating, allow the container to stand in the microwave oven for a short time before removing the container.
 - v) Use extreme care when inserting a spoon or other utensil into the container.

SAVE THESE INSTRUCTIONS

To Reduce the Risk of Injury to Persons

GROUNDING INSTRUCTIONS

DANGER

Electric Shock Hazard
Touching some of the internal components can cause serious personal injury or death. Do not disassemble this appliance.

WARNING

Electric Shock Hazard
Improper use of the grounding can result in electric shock. Do not plug into an outlet until appliance is properly installed and grounded.

Three-pronged (grounding) plug



This appliance must be grounded. In the event of an electrical short circuit, grounding reduces the risk of electric shock by providing an escape wire for the electric current. This appliance is equipped with a cord having grounding wire with a grounding plug. The plug must be

plugged into an outlet that is properly installed and grounded.

Consult a qualified electrician or serviceman if the grounding instructions are not completely understood or if doubt exists as to whether the appliance is properly grounded. If it is necessary to use an extension cord, use only a 3-wire extension cord that has a 3-pronged grounding plug, and a 3-slot receptacle that will accept the plug on the appliance. The marked rating of the extension cord shall be equal to or greater than the electrical rating of the appliance.

1. A short power-supply cord is provided to reduce the risks resulting from becoming entangled in or tripping over a longer cord.
2. Longer cord sets or extension cord is provided to reduce the risks resulting from becoming entangled in or tripping over a longer cord.
3. If a long cord sets or extension cord is used:
 - 1) The marked electrical rating of the cord set or extension marked electrical rating of the cord set or extension cord should be at least as great as the electrical rating of the appliance.
 - 2) The extension cord must be a grounding-type 3-wire cord.
 - 3) The longer cord should be arranged so that it will not drape over the countertop or tabletop where it can be pulled on by children or tripped over unintentionally.



UTENSILS

CAUTION

Personal Injury Hazard

Tightly-closed utensils could explode. Closed containers should be opened and plastic pouches should be pierced before cooking.

See the instructions on "Materials you can use in microwave oven or to be avoided in microwave oven."

There may be certain non-metallic utensils that are not safe to use for microwaving. If in doubt, you can test the utensil in question following the procedure below.

Utensil Test:

1. Fill a microwave-safe container with 1 cup of cold water (250ml) along with the utensil in question.
2. Cook on maximum power for 1 minute.
3. Carefully feel the utensil. If the empty utensil is warm, do not use it for microwave cooking.
4. **Do not exceed 1 minute cooking time.**

Materials you can use in microwave oven

Utensils Remarks

Aluminum foil	Shielding only. Small smooth pieces can be used to cover thin parts of meat or poultry to prevent overcooking. Arcing can occur if foil is too close to oven walls. The foil should be at least 1 inch (2.5cm) away from oven walls.
Browning dish	Follow manufacturer's instructions. The bottom of browning dish must be at least 3/16 inch (5mm) above the turntable. Incorrect usage may cause the turntable to break.
Dinnerware	Microwave-safe only. Follow manufacturer's instructions. Do not use cracked or chipped dishes.
Glass jars	Always remove lid. Use only to heat food until just warm. Most glass jars are not heat resistant and may break.
Glassware	Heat-resistant oven glassware only. Make sure there is no metallic trim. Do not use cracked or chipped dishes.
Oven cooking bags	Follow manufacturer's instructions. Do not close with metal tie. Make slits to allow steam to escape.
Paper plates and cups	Use for short-term cooking/warming only. Do not leave oven unattended while cooking.
Paper towels	Use to cover food for reheating and absorbing fat. Use with supervision for a short-term cooking only.
Parchment paper	Use as a cover to prevent splattering or a wrap for steaming.
Plastic	Microwave-safe only. Follow the manufacturer's instructions. Should be labeled "Microwave Safe". Some plastic containers soften, as the food inside gets hot. "Boiling bags" and tightly closed plastic bags should be slit, pierced or vented as directed by package.
Plastic wrap	Microwave-safe only. Use to cover food during cooking to retain moisture. Do not allow plastic wrap to touch food.
Thermometers	Microwave-safe only (meat and candy thermometers).
Wax paper	Use as a cover to prevent splattering and retain moisture.

Materials to be avoided in microwave oven

Utensils Remarks

Aluminum tray	May cause arcing. Transfer food into microwave-safe dish.
Food carton with metal handle	May cause arcing. Transfer food into microwave-safe dish.
Metal or metal-trimmed utensils	Metal shields the food from microwave energy. Metal trim may cause arcing.
Metal twist ties	May cause arcing and could cause a fire in the oven.
Paper bags	May cause a fire in the oven.
Plastic foam	Plastic foam may melt or contaminate the liquid inside when exposed to high temperature.
Wood	Wood will dry out when used in the microwave oven and may split or crack.

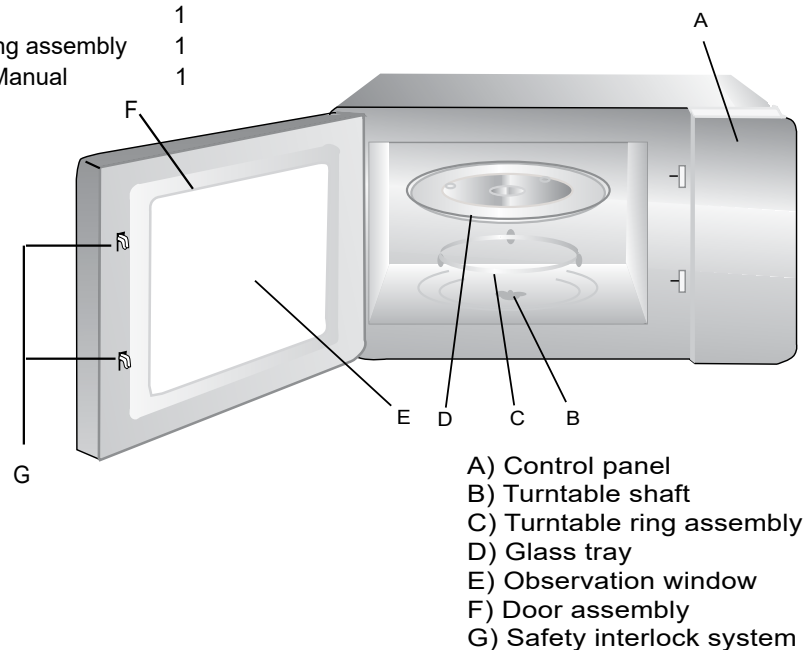
SETTING UP YOUR OVEN

Names of Oven Parts and Accessories

Remove the oven and all materials from the carton and oven cavity.

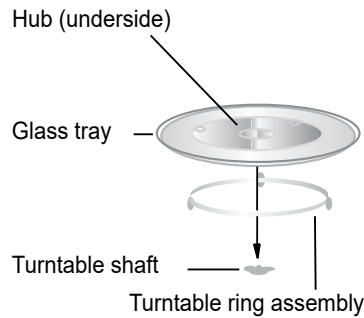
Your oven comes with the following accessories:

Glass tray	1
Turntable ring assembly	1
Instruction Manual	1





Turntable Installation



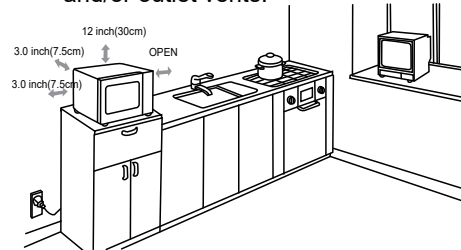
- Never place the glass tray upside down. The glass tray should never be restricted.
- Both glass tray and turntable ring assembly must always be used during cooking.
- All food and containers of food are always placed on the glass tray for cooking.
- If glass tray or turntable ring assembly cracks or breaks, contact your nearest authorized service center.

Countertop Installation

Remove all packing material and accessories. Examine the oven for any damage such as dents or broken door. Do not install if oven is damaged.

Installation

- Select a level surface that provides enough open space for the intake and/or outlet vents.



- Leave a minimum clearance of 12 inches (30cm) above the oven.**
- Do not remove the legs from the bottom of the oven.**

A minimum clearance of 3.0 inches (7.5cm) is required between the oven and any adjacent walls. One side must be open.

Cabinet: Remove any protective film found on the microwave oven cabinet surface.

Do not remove the light brown Mica cover that is attached to the oven cavity to protect the magnetron.

- Blocking the intake and/or outlet openings can damage the oven.
- Place the oven as far away from radios and TV as possible. Operation of microwave oven may cause interference to your radio or TV reception.
- Plug your oven into a standard household outlet. Be sure the voltage and the frequency is the same as the voltage and the frequency on the rating label.

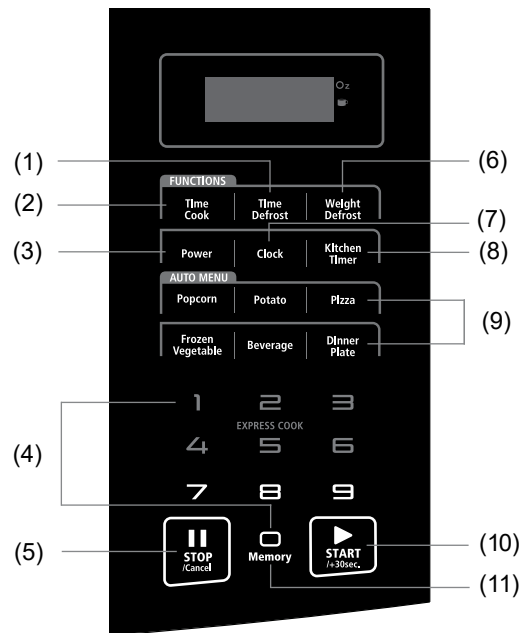
WARNING: Do not install oven over a range cooktop or other heat-producing appliance. Unless using manufactures built-in kit and instructions. If improbably installed near or over a heat source, the oven could be damaged and the warranty would be void.

For Built-in kits:

- Model number and brand of built-in kit: KITR2501S, HIGH POINTE
 - MWO model number and brand which employ built-in Kit: EM925AQR, HIGH POINTE
- IMPORTANT:** This Built-In Kit is ONLY For Use With HIGH POINTE Microwave Ovens Model EM925AQR Where This Built-In Kit, Model KITR2501S Is Specified On . The Back Of The Unit And In The INSTRUCTION MANUAL.

OPERATION

Control Panel and Features



- (1) Time Defrost
- (2) Time Cook
- (3) Power
- (4) Number keys
- (5) **Stop/Cancel:** clears all previous settings pressed before cooking starts. During cooking: press once to stop oven; twice to stop and clear all entries.
- (6) Weight Defrost
- (7) Clock
- (8) Kitchen Timer
- (9) Auto Menu
- (10) Start/ +30SEC.
- (11) Memory



OPERATION

1. Power Level

11 power levels are available.

Level	10	9	8	7	6	5	4	3	2	1	0
Power	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%
Display	PL10	PL9	PL8	PL7	PL6	PL5	PL4	PL3	PL2	PL1	PL0

2. Clock Setting

- (1) Press "**CLOCK**" once, "00:00" will display.
- (2) Press the number keys and enter the current time. For example, time is 12:10 now, please press "1, 2, 1, 0" in turn.
- (3) Press "**CLOCK**" to finish clock setting. ":" will flash and the clock will be lighted.
- (4) If the numbers input are not within the range of 1:00--12:59, the setting will be invalid until valid numbers are input.

Note: (1) In the process of clock setting, if the "**STOP/CANCEL**" button is pressed or if there is no operation within 1 minute, the oven will go back to the former setting automatically.

- (2) If the clock need to be reset, please repeat step 1 to step 3.

3. Kitchen Timer

- (1) Press "**KITCHEN TIMER**" once, the screen will display 00:00, the first hour figure flash.
- (2) Press the number keys and enter the timer time. (The maximum cooking time is 99 minutes and 99 seconds.)
- (3) Press "**START/+30SEC.**" to confirm setting.
- (4) When the timer time arrives, the buzzer will ring 5 times.

If the clock has been set (12-hour system), the screen will display the current time.

Note: 1) The kitchen time is different from 12-hour system. Kitchen Timer is a timer.

- 2) During kitchen timer, any program cannot be set.

4. Microwave cook

- (1) Press "**TIME COOK**" once, the screen will display "00:00".
- (2) Press number keys to input the cooking time; the maximum cooking time is 99 minutes and 99 seconds.
- (3) Press "**POWER**" once, the screen will display "PL10". The default power is 100% power. Now you can press number keys to adjust the power level.
- (4) Press "**START/+30SEC.**" to start cooking.

Example: to cook the food with 50% microwave power for 15 minutes.

- a. Press "**TIME COOK**" once. "00:00" displays.
- b. Press "1", "5", "0", "0" in order.
- c. Press "**POWER**" once, then press "5" to select 50% microwave power.
- d. Press "**START/+30SEC.**" to start cooking.

Note: 1) In the process of setting, if the "**STOP/CANCEL**" button is pressed or if there is no operation within 1 minute, the oven will go back to the former setting automatically.

- 2) If "PL 0" selected, the oven will work with fan for no power. You can use this level to remove the odour of the oven.

- 3) During microwave cooking, "**POWER**" can be pressed to change the power you need. After pressing "**POWER**", the current power flash for 3 seconds, now you can press number button to change the power. The oven will work with the selected power for the rest time.

5. Speedy Cooking

- (1) In waiting state, instant cooking at 100% power level can be started by select a cooking time from 1 to 6 minutes by pressing number pads 1 to 6. Press "**START/+30SEC.**" to increase the cooking time; the maximum cooking time is 99 minutes and 99 seconds.
- (2) In waiting state, instant cooking at 100% power level with 30 seconds' cooking time can be started by pressing "**START/+30SEC**". Each press on the same button will increase cooking time by 30 seconds. the maximum cooking time is 99 minutes and 99 seconds.

Note: during microwave cooking and time defrost, time can be added by pressing "**START/+30SEC.**" button.

6. Weight Defrost Function

- (1) Press "**WEIGHT DEFROST**" once, the screen will display "dEF1".
- (2) Press numerical buttons to input weight to be defrosted.
Input the weight ranged between 4~100 Oz.
- (3) Press "**START/+30SEC.**" to start defrosting and the cooking time remained will be displayed.

7. Time Defrost Function

- (1) Press "**TIME DEFROST**" once, the screen will display "dEF2".
- (2) Press number pads to input defrosting time. The effective time range is 0:01~99:99.
- (3) The default microwave power is power level 3. If you want to change the power level, press "**POWER**" once, and the screen will display "PL 3", then press the number pad of the power level you wanted.
- (4) Press "**START/+30SEC.**" to start defrosting. The remained cooking time will be displayed.

8. POPCORN

- a) Press "**POPCORN**" repeatedly until the number you wish appears in the display, "1.75", "3.0", "3.5" Oz will display in order.
For example, press "**POPCORN**" once, "1.75" appears.
- b) Press "**START/+30 SEC.**" to cook, buzzer sounds once. When cooking finishes, buzzer will sound five times and then turn back to waiting state.

9. POTATO

- a) Press "**POTATO**" repeatedly until the number you wish appears in the display, "1", "2", "3" will display in order.
"1"SET : 1 potato (approximate 8 Oz)
"2"SETS: 2 potatoes (approximate 16 Oz)
"3"SETS: 3 potatoes (approximate 24 Oz)
For example, press "**POTATO**" once, "1" appears.
- b) Press "**START/+30 SEC.**" to cook, buzzer sounds once. When cooking finishes, buzzer sounds five times and then turn back to waiting state.

10. FROZEN VEGETABLE

- a) Press "**FROZEN VEGETABLE**" repeatedly until the number you wish appears in the display, "4.0", "8.0", "16.0" Oz will display in order.
For example, press "**FROZEN VEGETABLE**" once, "4.0" appears.
- b) Press "**START/+30 SEC.**" to cook, buzzer sounds once. When cooking finishes, buzzer sounds five times and then turn back to waiting state.



11. BEVERAGE

- a) Press "**BEVERAGE**" repeatedly until the number you wish appears in the display, "1", "2", "3" cup will display in order. One cup is about 120ml. For example, press "**BEVERAGE**" once, "1" appears.
- b) Press "**START/+30 SEC.**" to cook, buzzer sounds once. When cooking finishes, buzzer sounds five times and then turn back to waiting state.

12. DINNER PLATE

- a) Press "**DINNER PLATE**" repeatedly until the number you wish appears in the display, "9.0", "12.0", "18.0" Oz will display in order. For example, press "**DINNER PLATE**" once, "9.0" appears.
- b) Press "**START/+30 SEC.**" to cook, buzzer sounds once. When cooking finishes, buzzer sounds five times and then turn back to waiting state.

13. PIZZA

- a) Press "**PIZZA**" repeatedly until the number you wish appears in the display, "4.0", "8.0", "14.0" Oz will display in order. For example, press "**PIZZA**" once, "4.0" appears.
- b) Press "**START/+30 SEC.**" to cook, buzzer sounds once. When cooking finishes, buzzer sounds five times and then turn back to waiting state.

14. MEMORY FUNCTION

- (1) Press "**0/MEMORY**" to choose memory 1-3 procedure. The screen will display 1, 2, 3.
- (2) If the procedure has been set, press "**START/ +30 SEC.**" to use it. If not, continue to set the procedure. Only one or two stages can be set.
- (3) After finishing the setting, press "**START/ +30 SEC.**" once to save the procedure. If press "**START/ +30 SEC.**" again, it will start cooking.

Example: To set the following procedure as the second memory, that is memory 2.

To cook the food with 80% microwave power for 3 minutes and 20 seconds.

The steps are as follow:

- a. In waiting states, press "**0/MEMORY**" twice, stop pressing until the screen displays "2".
- b. Press "**TIME COOK**" once, then press "3", "2", "0" in order.
- c. Press "**POWER**" once, "PL10" displays, then press "8" and "PL8" displays.
- d. Press "**START/ +30 SEC.**" to save the setting. Buzzer sounds once and the screen will display "2". If you press "**START/+30SEC.**" again, the procedure will be saved as the memory 2 and operated.
- e. If the electricity is not cut off, the procedure will be saved all the time. If it is, the procedure need to reset.
- f. If you want to run the saved procedure, in waiting state, press "**0/MEMORY**" twice, screen displays "2", then press "**START/+30SEC.**" to run.

15. Multi-stage cooking


At most 2 stages can be set for cooking. In multi-stage cooking, if one stage is defrosting, then defrosting shall be placed at the first stage automatically.

Note: Auto cooking cannot work in the multi-stage cooking.

Example: if you want to cook with 80% microwave power for 5 minutes + 60% microwave power for 10 minutes. The cooking steps are as following:

- (1) Press "**TIME COOK**" once, then press "5", "0", "0" to set the cooking time;
- (2) Press "**POWER**" once, then press "8" to select 80% microwave power.
- (3) Press "**TIME COOK**" once, then press "1", "0", "0", "0" to set the cooking time;
- (4) Press "**POWER**" once, then press "6" to select 60% microwave power.
- (5) Press "**START/ +30 SEC.**" to start cooking.

16. LOCK FUNCTION FOR CHILDREN

Lock: In waiting state, press " **STOP/CANCEL** " for 3 seconds, there will be a long "beep" denoting the entering into the children-lock state; meanwhile, screen will display "  ".

Lock quitting: In locked state, press " **STOP/CANCEL** " for 3 seconds, there will be a long "beep" denoting that lock is released.

17. INQUIRING FUNCTION

- (1) In cooking state, press " **CLOCK** ", the oven will display clock for three seconds.
- (2) In the microwave cooking state, press " **POWER** " to inquire microwave power level, and the current microwave power will be displayed. After three seconds, the oven will turn back to the previous state. In multi-stage state, the inquiring way can be done by the same way as above.

18. COOKING END REMINDING FUNCTION

When the cooking is over, the buzzer will sound 5 "beep"s to alert user the cooking is finished.

19. OTHER SPECIFICATIONS

- (1) In standby state , if the set clock digital tube displays current time, the icon " : " would flash; otherwise, it shows " **0:00** ".
- (2) In setting function state, the screen displays corresponding setting.
- (3) In working or pause state, the screen displays surplus cooking time.



Maintenance

Troubleshooting

Check your problem by using the chart below and try the solutions for each problem. If the microwave oven still does not work properly, contact the nearest authorized service center.

TROUBLE	POSSIBLE CAUSE	POSSIBLE REMEDY
Oven will not start	<ul style="list-style-type: none"> a. Electrical cord for oven is not plugged in. b. Door is open. c. Wrong operation is set. 	<ul style="list-style-type: none"> a. Plug into the outlet. b. Close the door and try again. c. Check instructions.
Arcing or sparking	<ul style="list-style-type: none"> a. Materials to be avoided in microwave oven were used. b. The oven is operated when empty. c. Spilled food remains in the cavity. 	<ul style="list-style-type: none"> a. Use microwave-safe cookware only. b. Do not operate with oven empty. c. Clean cavity with wet towel.
Unevenly cooked foods	<ul style="list-style-type: none"> a. Materials to be avoided in microwave oven were used. b. Food is not defrosted completely. c. Cooking time, power level is not suitable. d. Food is not turned or stirred. 	<ul style="list-style-type: none"> a. Use microwave-safe cookware only. b. Completely defrost food. c. Use correct cooking time, power level. d. Turn or stir food.
Overcooked foods	Cooking time, power level is not suitable.	Use correct cooking time, power level.
Undercooked foods	<ul style="list-style-type: none"> a. Materials to be avoided in microwave oven were used. b. Food is not defrosted completely. c. Oven ventilation ports are restricted. d. Cooking time, power level is not suitable. 	<ul style="list-style-type: none"> a. Use microwave-safe cookware only. b. Completely defrost food. c. Check to see that oven ventilation ports are not restricted. d. Use correct cooking time, power level.
Improper defrosting	<ul style="list-style-type: none"> a. Materials to be avoided in microwave oven were used. b. Cooking time, power level is not suitable. c. Food is not turned or stirred. 	<ul style="list-style-type: none"> a. Use microwave-safe cookware only. b. Use correct cooking time, power level. c. Turn or stir food.

For High Pointe Microwave Warranty (1-year) issues, contact the Oliver Travel Trailer Service Department at 1-888-526-3978



Installation and Operation Guide for PD9100 / 9200 Series Power Converter



FEATURING
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(ON SELECT MODELS)



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110953E



INSTALLATION INSTRUCTIONS

NOTES:

- Horizontal mounting of the power converter, is recommended although it can be mounted in any position that provides unobstructed ventilation to the fan and vent holes.
- The OEM should test the power converter under full load conditions in its intended mounting location. This will insure that there is sufficient unobstructed ventilation to the converter allowing it to operate at its maximum rated load. Failure to provide adequate ventilation to the converter will cause the converter output to be reduced as it responds to ambient conditions.
- The INTELI-POWER converters are not designed for zero clearance compartments.
- Use a 5/32" hex driver to tighten the output screws. Do not exceed 50 in-lbs. torque on the output terminals.
- The INTELI-POWER converters are not weather tight or designed for wet mounting locations. They must be protected from direct contact with water.
- Avoid the introduction of foreign materials into the case as this could damage or cause a malfunction of the converter.

Torque Data

DC Lugs: 30 – 50 IN LBS

Battery Ground Lug: 25 – 35 IN LBS

DO NOT REMOVE TERMINAL BLOCK SCREWS

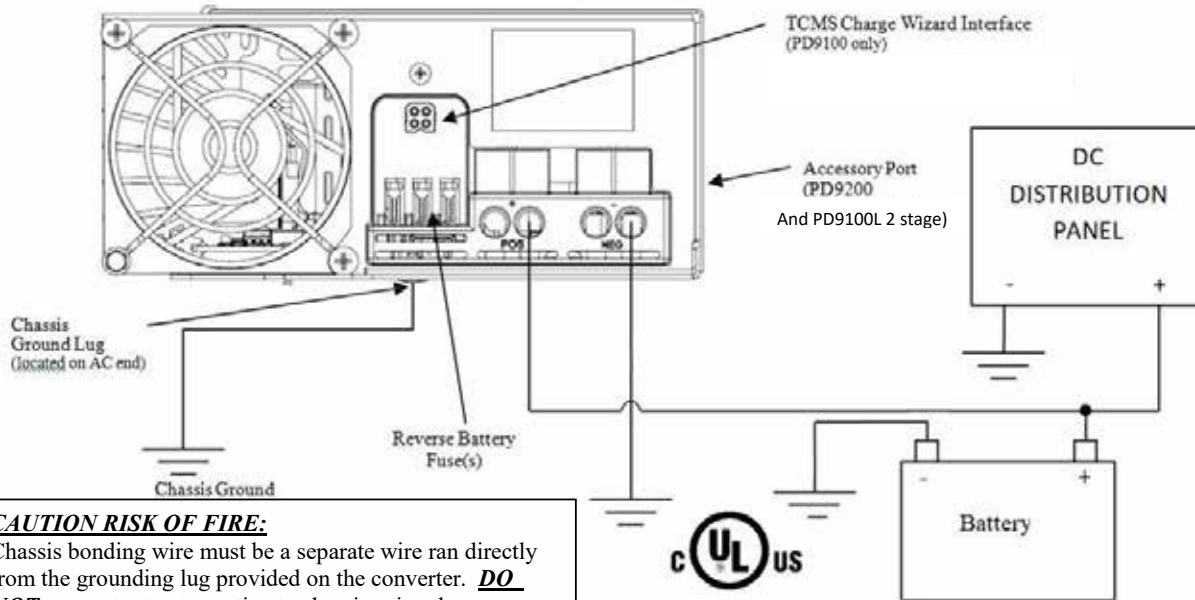
Installation Steps:

1. Secure converter firmly to mounting surface.
2. Connect chassis ground lug (found on unit base) to chassis.
 - Ground wire to be between 6 and 12AWG wire.
3. Disconnect battery from both positive (+) and ground (-) cables.
4. Connect battery ground (-) to converter NEG (-) lug.
 - Conductor to be between 2 and 14AWG (follow all applicable codes when sizing conductor)
5. Disconnect any optional pendants or modules.
6. Plug converter into appropriate outlet.
7. Using a DC voltmeter, verify converter output.

If no output is present, refer to the trouble shooting guide in this manual and on the website.
8. Disconnect power to converter
9. Connect battery positive (+) to converter POS (+) lug.
 - Conductor to be between 2 and 14AWG (follow all applicable codes when sizing conductor)

Note: When connecting battery to converter POS (+), a spark may occur. This is normal.

10. Reconnect cables.
11. Reconnect any optional pendants or modules.
12. Reconnect power to converter.



CAUTION RISK OF FIRE:

Chassis bonding wire must be a separate wire ran directly from the grounding lug provided on the converter. **DO NOT** connect output negative to chassis using the same wire.



FEATURES

MULTIPLE BATTERY CHARGING... INTELI-POWER converters have the capability of charging multiple batteries at the same time! They can even charge a combination of different capacity batteries.

GFCI PROTECTION... INTELI-POWER converters have the LOWEST ground fault leakage. The user can confidently utilize the RV's AC outlets without concern of ground fault interruption of the facilities power source.

REVERSE BATTERY PROTECTION prevents damage if battery leads are cross connected. Since the only consequence of cross connection is a blown fuse, damage to or possible replacement of the converter is avoided. Cross connection of battery leads is the only thing that will blow these fuses. Replacement fuses are available at any automotive store.

GENERAL OPERATION

The INTELI-POWER series converter will supply "clean" power from input voltages that range from 105-130 VAC.

The INTELI-POWER series of converters are designed for use with a battery; however, filtered DC voltage can power sensitive electronics without the need for a battery or other filtering.

At normal input voltages the full load rated capacity is available. At input voltages less than 105 VAC the converter may not supply full rated output capacity.

9100 / 9100L/9100AL - The full rated load is available for load, battery charging or both. When charging the battery, the converter has a nominal voltage output of 13.6 VDC (14.6 VDC for 9100L series) for 12 volt models and 27.2 VDC (28.55 VDC for 9100L series) for 24 volt models.

9100L/9100AL (2-Stage) - When charging the battery, the converter has a nominal voltage output of 14.6 VDC. When the converter senses an output current drop below a preset level, the converter will automatically switch to IDLE mode and the voltage output will drop to 13.6VDC

CAUTION

**The 9100AL series converter/chargers are designed to recharge lithium iron phosphate batteries.
DO NOT USE TO RECHARGE LEAD/ACID BATTERIES!**

When storing the vehicle for extended periods of time, disconnect the batteries unless a TCMS Charge Wizard is attached. Reconnect battery once a month to maintain a full charge.

CAUTION

IF THE REVERSE BATTERY PROTECTION FUSES ARE BLOWN DURING INSTALLATION, CHECK TO SEE THAT THE BATTERY HAS BEEN CONNECTED PROPERLY BEFORE REPLACING THE FUSES. REPLACE THE FUSES ONLY WITH THE SAME TYPE AND RATING AS THE ORIGINAL FUSES. USING OTHER FUSES MAY RESULT IN CONVERTER DAMAGE, VEHICLE DAMAGE, INJURY OR OTHER CONSEQUENCES (SEE WARRANTY).

WARNING:

THIS EQUIPMENT EMPLOYS COMPONENTS THAT TEND TO PRODUCE ARCS OR SPARKS - TO PREVENT FIRE OR EXPLOSION DO NOT INSTALL IN COMPARTMENTS CONTAINING BATTERIES OR FLAMMABLE MATERIALS.

9200 - The full rated load is available for load, battery charging or both. When charging the battery, the converter has a nominal voltage output of 13.6 VDC for 12 volt models and 27.2 VDC for 24 volt models. The system will sense voltage on the battery and automatically select one of three operating modes (normal, boost and storage) to provide the correct charge level to the batteries.

BOOST MODE: If the voltage drops below a preset level the output voltage is increased to approximately 14.4 VDC (28.8 VDC for 24 volt models) to rapidly recharge the battery.

NORMAL MODE: Output voltage set at approximately 13.6 VDC (27.2 VDC for 24 volt models).

STORAGE MODE: If there is no significant battery usage for 30 hours the output voltage reduces to 13.2 VDC (26.4 VDC for 24 volt models) for minimal water usage. In storage mode, the output voltage increases to 14.4 VDC (28.8 DC for 24 volt models) for approximately 15 minutes every 21 hours to help prevent sulfation of the battery plates.

CAUTION

IT IS IMPORTANT THAT THE FLUID LEVEL OF ANY CONNECTED BATTERIES BE CHECKED ON A REGULAR BASIS. ALL BATTERIES WILL "GAS" AND LOSE SOME FLUIDS WHEN CONTINUOUSLY CONNECTED TO ANY CHARGING SOURCE



PROGRESSIVE DYNAMICS POWER CONVERTER

PD9130(L) Input: 105-130 VAC 60 Hz 500 Watts Output: 13.6 VDC, 30 Amps (9130L) – 14.6 VDC, 30 Amps Dimensions: 4.5H x 8.25L x 7.25W Weight: 4.5lbs	PD9_45(L) Input: 105-130 VAC 60 Hz 725 Watts Output: 13.6 VDC, 45 Amps (9145L) – 14.6 VDC, 45 Amps Dimensions: 4.5H x 8.25L x 7.25W Weight: 4.5lbs	PD9_60(L) Input: 105-130 VAC 60 Hz 1000 Watts Output: 13.6 VDC, 60 Amps (9160L) – 14.6 VDC, 60 Amps Dimensions: 3.6H x 8L x 9W Weight: 5.8lbs	PD9_70 Input: 105-130 VAC 60 Hz 1250 Watts Output: 13.6 VDC, 70 Amps (9170L) – 14.6 VDC, 70 Amps Dimensions: 3.6H x 8L x 9W Weight: 5.8lbs
PD9_80A(L) Input: 105-130 VAC 60 Hz 1300 Watts Output: 13.6 VDC, 80 Amps (9180AL) – 14.6 VDC, 80 Amps Dimensions: 3.6H x 8L x 9W Weight: 6.0lbs		PD9_25-24(L) Input: 105-130 VAC 60 Hz 900 Watts Output: 27.2 VDC, 25 Amps (9125-24L) – 28.55 VDC, 25 Amps Dimensions: 4.5H x 8.25L x 7.25W Weight: 4.5lbs	PD9_40-24A(L) Input: 105-130 VAC 60 Hz 1300 Watts Output: 27.2 VDC, 40 Amps (9140-24AL) – 28.55 VDC, 40 Amps Dimensions: 3.6H x 8L x 9W Weight: 6.0lbs

TROUBLE SHOOTING GUIDE

PROBLEM	POSSIBLE CAUSES	ACTION
1. No Output	Proper AC power not connected	Connect power supply Check AC distribution panel for proper operation
	External Fuses Blown	Check for reverse polarity Replace fuses with same type and rating
	Short Circuit	Trace circuits for possible fault
	Unit has shutdown due to overheating	Check air flow Allow unit to cool
	Unit has shutdown due to over voltage (Also see Item 4 below) (No over voltage protection for 230V units)	Check input voltage Converter will shut down if the input voltage exceeds 132 Volts Correct input voltage
2. External Fuses Blown	Reverse Battery Hook Up	Correct hook up and replace fuses with same type and rating
3. Low Output	Excessive load for converter	Reduce load requirements or install larger converter
	Input voltage not between 105-130 VAC	Correct input supply voltage
	Bad battery cell(s)	Replace battery
	Mild Overheating	Check air flow Allow unit to cool
4. Intermittent or no Output on Generator, works on Shore Power	Unit has shutdown due to over voltage.	Add another load to the generator, this may reduce the “spikes” to an acceptable level
	Some generators exhibit excessive voltage spikes on the AC power output, this may cause the over voltage protection to shut the unit down	Contact generator manufacturer for possible defect in the generator

Please refer to website for further trouble shooting information.

See website www.progressivedyn.com for more troubleshooting information and return instructions.

LIMITED WARRANTY: Progressive Dynamics, Inc. warrants its power control center to be free from defects in material or workmanship under normal use and service for a period of two years from the original date of purchase; and limits the remedies to repair or replacement.

This warranty is valid only within the continental limits of the United States and Canada.

See website www.progressivedyn.com for more warranty information and return instructions



Progressive Industries

Instruction Manual

Electrical Management System (EMS) EMS-HW30C & EMS-HW50C



EMS-HW50C



EMS-HW30C



These instructions are intended to provide assistance with the installation of this product, and are not a substitute for a more comprehensive understanding of electrical systems. We strongly recommend that a certified electrician perform the installation of this product. Improper installation shall void warranty.



Installation Instructions Before Transfer Box

Visual Photo Library - HW50C: page 9 | HW30C: page 10

Wiring Diagram - HW50C: page 11 | HW30C: page 11

For installation, in addition to the EMS Kit, you will need:

- 4 mounting screws.
- In some cases you will need a jumper cable, length to be determined based on the placement of the EMS.
- Always use 10 wire for the HW30C & #6 wire for the HW50C.

- 1) Unplug RV from AC power and be sure generator is off.
- 2) Determine a location for the EMS control box.
- 3) Cut the RV power cord about three (3) inches greater than the distance from the junction box to the desired location of the EMS control box. Then strip back the outer insulation three (3) inches on input, and three (3) inches on output cable. See visual references on page 9.
- 4) Strip back each conductor 3/8" on both stripped ends (see visual references on page 9) and attach ring terminals to green ground wires. If this wire is a solid wire, do not use ring terminals. Loop the wire around the ground screw.
- 5) Remove the lid from the EMS. Inside the unit will be a display, cable and pack of screws. Back off the six set screws from top of contactor (L1, L2, etc.).
- 6) Take your long cable with the plug end and connect it to the input side by sliding through the wire restraint on the end of the EMS control box. Next connect the wires to the contactor by attaching the black wire to L1, white to L2, red to L3, and green to ground screw on side of box. See visual references on page 9. Torque down set screws and ground nut to secure connections.
- 7) Take the short cable coming from the junction box by sliding it through the wire restraint output side of the EMS control box. Next slide the black wire through the current sensor containing the green mark and connect to T1, then connect the white wire to T2. Now slide the red wire through the other sensor and attach to T3. The current sensor(s) can be oriented in either direction.

Attach the green ground wire to the ground screw on side of box (see visual references on page 9). Make sure the wire colors match up adjacent to each other. Torque down set screws and ground nut to secure connections.

- 8) Double check all connections and make sure they are secure.
- 9) Remove the two screws on contactor where marked L1, L2, etc. Next remove the top plastic plate with markings. Examine inside ensuring there are no loose plastic pieces inside the contactor. If so, remove and re-install cover with two screws. See visual references on page 9. Do not over tighten screws as this could break cover tabs.



⚠ CAUTION If you break off a tab and do not remove it, this may stop the contactor from working and allow 240 volts in the RV.

- 10) Secure cable ends by tightening down strain reliefs over the input and output wires. Do not over tighten as this could cut through the insulation and cause a short.
- 11) Set time delay jumper on the circuit board. The factory setting is for 15 seconds. Remove jumper to set for 136 seconds (02:16). See Features Section on time delay to determine which to use. See visual references on page 9.
- 12) Plug in remote display and cable (this cable is not a phone cable, but rather a data cable).

NEVER PLUG IN DISPLAY WHILE RV POWER IS ON.

- 13) Attach EMS lid with the six black machine screws provided.
- 14) Mount the EMS control box.
- 15) Installation is complete. Next, plug in and follow operating instructions.

Installation After Transfer Box for Protection from both Generator and AC Power

Visual Photo Library - HW50C: page 9 | HW30C: page 10

Wiring Diagram - HW50C: page 11 | HW30C: page 11

For installation, in addition to the EMS Kit, you will need:

- 4 mounting screws.
- In some cases you will need a jumper cable, length to be determined based on the placement of the EMS.
- Always use 10 wire for the HW30C & #6 wire for the HW50C.

- 1) Unplug RV from the AC power and be sure generator is off.
- 2) Locate transfer switch box; determine where the EMS control box will be mounted.
- 3) Measure the distance between the transfer switch and the control box and add one (1) foot. This is the length of cable that will be required for the installation. Make sure 6-gauge, 4 conductor cables are used.
- 4) Remove lid from transfer box, disconnect and remove the output cable.
- 5) Take jumper cable and strip back one end three (3) inches and the other end the same as the end removed from the transfer box. The cable removed from the transfer box must have at least three (3) inches of the outer insulation removed. See visual references on page 9.
- 6) Strip back all conductors 3/8" and attach ring terminals to green ground wires. See visual references on page 9. If this wire is solid wire, do not use ring terminals. Loop the wire around the screw.



- 7) Remove the lid from unit. Inside the unit will be a digital display, cable and pack of screws. Back off the six set screws from top of contactor (L1, L2, etc.).
- 8) Take the jumper cable and connect it to the input side by sliding through the wire restraint on the end of the EMS control box and then connect the black wire to L1; white to L2; red to L3, green to ground screw. See visual references on page 9. Torque down set screws and ground nut to secure connections.
- 9) The cable that came from the transfer box connects to the output side of the EMS control box in the same manner. Next slide the black wire through the current sensor containing the green mark and connect to T1 and then connect the white wire to T2. Now slide the red wire through the other current sensor and attach to T3. Next, attach the green ground wire to the ground screw on the side of box. See visual references on page 9. Make sure the conductor's colors match up across from each other. Torque down the set screws and ground nut to secure connections.
- 10) Connect the loose end of the jumper cable to the transfer switch. See wiring diagram on transfer switch if needed.
- 11) Double check all connections to ensure they are secure.
- 12) Secure cable ends by tightening down strain reliefs over the input and output wires. Do not over tighten as this could bite through insulation and cause a short.
- 13) Set time delay jumper on the circuit board. Factory setting is for 15 seconds. Remove jumper to change setting to 136 seconds (02:16). See Features Section on time delay to determine which to use. See visual references on page 9.
- 14) Plug in digital remote and data cable (this cable is not a phone cable, but rather a data cable.)

NEVER PLUG IN THE DISPLAY WHILE RV POWER IS ON.

- 15) Attach lid with the six black machine screws provided and attach transfer switch lid.
- 16) Mount the EMS control box.
- 17) Installation is complete. Next, plug in and follow operating instructions.

Operating Instructions

- 1) Plug into A/C power.
- 2) Digital display will read 888 for one second and then begin scrolling the voltage, amps, line frequency and error code, if any. In addition, the time delay light will flash while the EMS is going through its countdown and will stop when the unit engages (bottom right hand corner.) If delay light does not flash, a fault condition is present. Refer to the Error Code Chart (page 7) to determine the problem with the AC power.
- 3) You may notice when first plugging in, the display may read **E 9**. This indicates the display has not received the data from the computer yet. Do not be alarmed, this is normal. By the next scroll through, it should read **E 0** if the AC power is normal.



- 4) The digital display will give you a three digit number indicating your line voltage. Next, it will give you an "0A" reading indicating the current (amps). **The current (amps) will read zero until the time delay is complete (136 seconds or 16 seconds, depending on your settings). The output power will remain off until the time delay is finished.** Next the unit will indicate a number between 0 and 50 which indicates how many amps the RV is drawing. The next number indicates your line frequency. This number should be "60H" and should remain fairly consistent; however, it may read plus/minus one or two. Lastly, note the E code. **E 0** is normal and only when **E 0** or **E 10** is present will the delay light flash and allow power to the RV. Refer to the Error Code Chart card that was provided with your unit or see the Error Code Chart (page 7) for additional information.
- 5) Set up will be complete when the Error Code **E 0** is displayed.

NOTE: If the wiring reads anything different than correct, the EMS will not turn on and we recommend you move to a different source of AC power or use your generator power. Also, if power is below 104 volts or above 132 volts, the EMS will not turn on, and we recommend using your generator power.

Display Code Chart

L1 - Line 1
XXX - Line 1 Voltage
XXA - Line 1 Amps
L2 - Line 2
XXX - Line 2 Voltage
XXA - Line 2 Amps
XXH - Frequency in Hertz (Hz)
E X - Error Code
PE X - Previous Error Code that has been corrected (If Applicable).

Error Code Chart

E 0 - Normal Operating Condition
E 1 - Reverse Polarity (hot and neutral wires reversed)
E 2 - Open Ground (no ground wire connection)
E 3 - Line 1 High Voltage (line voltage above 132V)
E 4 - Line 1 Low Voltage (line voltage below 104V)
E 5* - Line 2 Voltage High (Line voltage above 132V)
E 6* - Line 2 Voltage Low (Line voltage below 104V)
E 7 - Line Frequency High (line frequency above 69Hz)
E 8 - Line Frequency Low (line frequency below 51Hz)
E 9 - Data Link Down (call technical support)
E 10 - Replace Surge Protector Module (call Progressive Industries Tech Support)

** Code only apply to EMS-HW50C models*

Note: PE is a previous error code that HAS BEEN RECTIFIED.

If the EMS cuts the power to the RV it will show a PE code following the E code. This denotes the previous error or why the EMS shut down. Example: The EMS cuts power



for low voltage on Line 1, and then the power is restored. The Error Code reads **E0**, but the PE code reads PE 4 which tells the user low voltage was the reason for the EMS previously cutting power. This PE error code will be deleted when power is disconnected from the EMS.

Accidental 240 volt Protection: Should this condition occur, the display will read 240 volts instead of displaying the voltage and the error code message will read **E3**. AC power will shut down instantly. DO NOT UNDER ANY CIRCUMSTANCES BYPASS THE EMS AS THIS WILL RESULT IN SEVERE DAMAGE TO THE RV.

Troubleshooting Guide

Common installation mistakes:

- 1) Check connections.

Visual Photo Library - HW50C: page 9 | HW30C: page 10
Wiring Diagram - HW50C: page 11 | HW30C: page 11

- **HW50C:** Input is the plug side of the RV and black should be attached to L1, white to L2 and red to L3. Output (going to the RV) should match up. T1 black, T2 white and T3 red. The green ground gets attached to the input and output on the side of the box.
 - **HW30C:** Input is the plug side of the RV and black should be attached to L1, white to L2. Output (going to the RV) should match up. T1 is black, T2 white. The green ground gets attached to the input and output on the side of the box.
- 2) Make sure the input wires are, in fact, the input wires. Connecting the output to the input of the EMS will cause the device to malfunction.
 - 3) If the EMS is still not functioning at this point, follow instructions below prior to calling Progressive Industries Technical Support.

In order for the on-call Technician to help troubleshoot the problem(s) you are experiencing and render the best possible solution, it is necessary you be at your RV when you place your call. If the display is illuminated and scrolling information, note the Error Code. If there is an Error code of 1-9, the device will interrupt the power. See Error Chart for definition of AC power problem. The device being off when an Error Code is present indicates the product is working properly and protecting your coach.

- 1) If the display is illuminated and reading Error code **E 0**, and yet no power is present in the coach, please contact Progressive Industries Tech Support. You must wait for the time delay light to stop flashing.
- 2) If the display is not illuminated and power is in the coach there is a connection issue between the display and the main control box. Contact Technical Support.

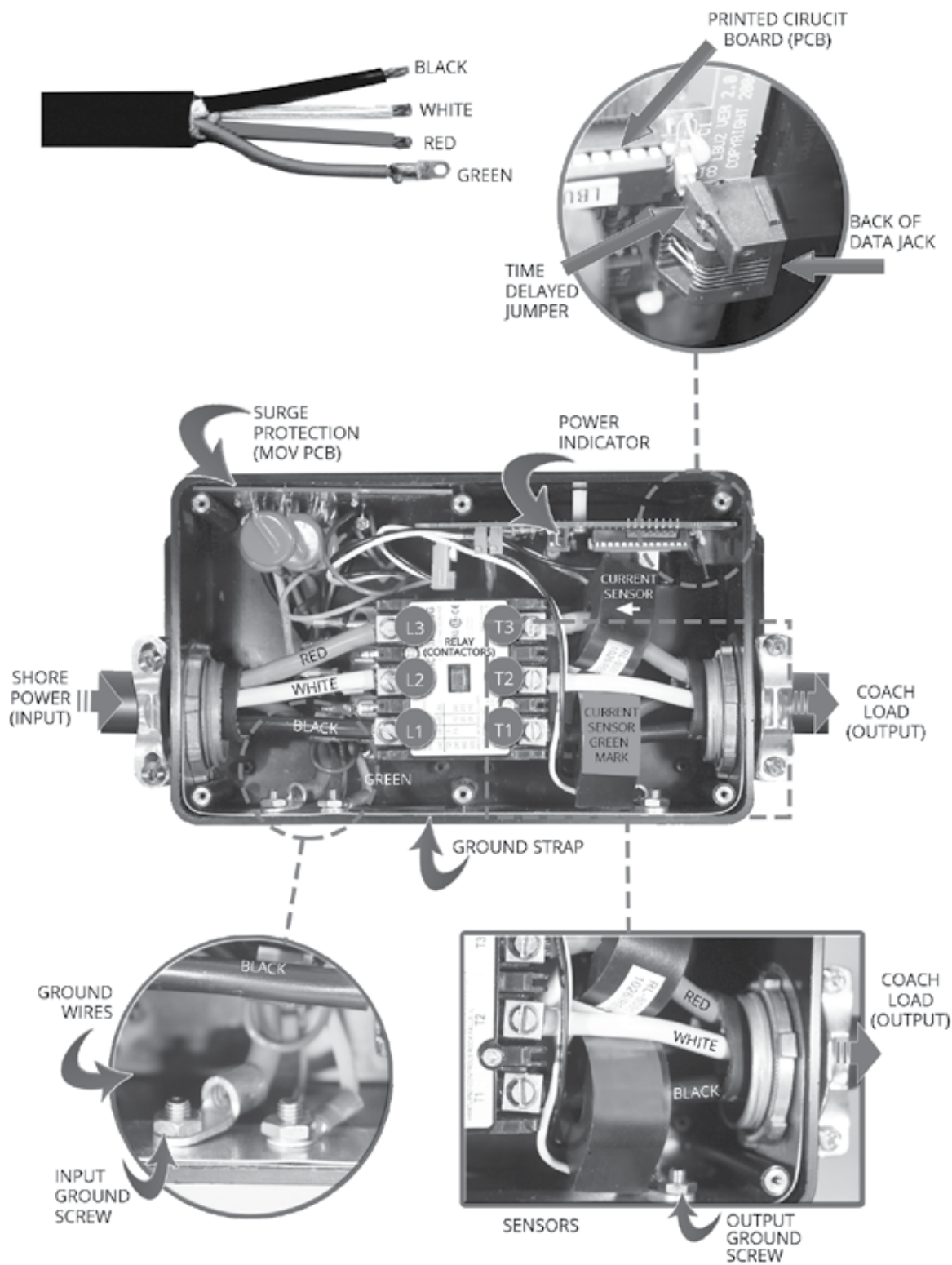
Our Tech Support Team can only assist you if the above information is provided; therefore, it is necessary for you to be at the RV when you place your call. To recap...

- 1) Are the connections correct?
- 2) What is the Error Code message being displayed?
- 3) Is the delay indicator flashing?



Visual References

Photo Library for the EMS-HW50C

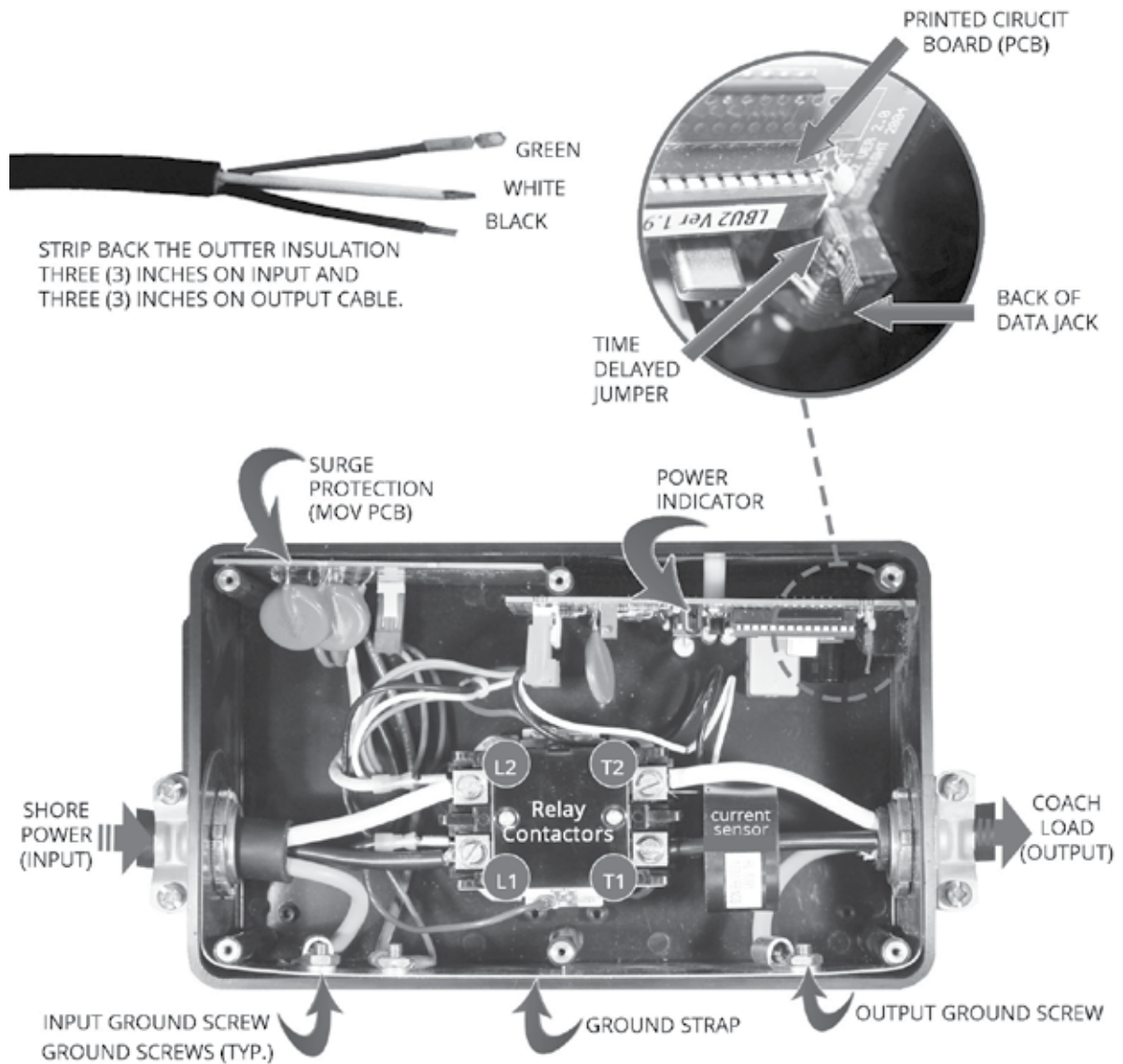


NOTE:

Only one (1) wire through each sensor.
Black wire goes through current sensor (with green mark) to T1.
Red wire goes through current sensor to T3.

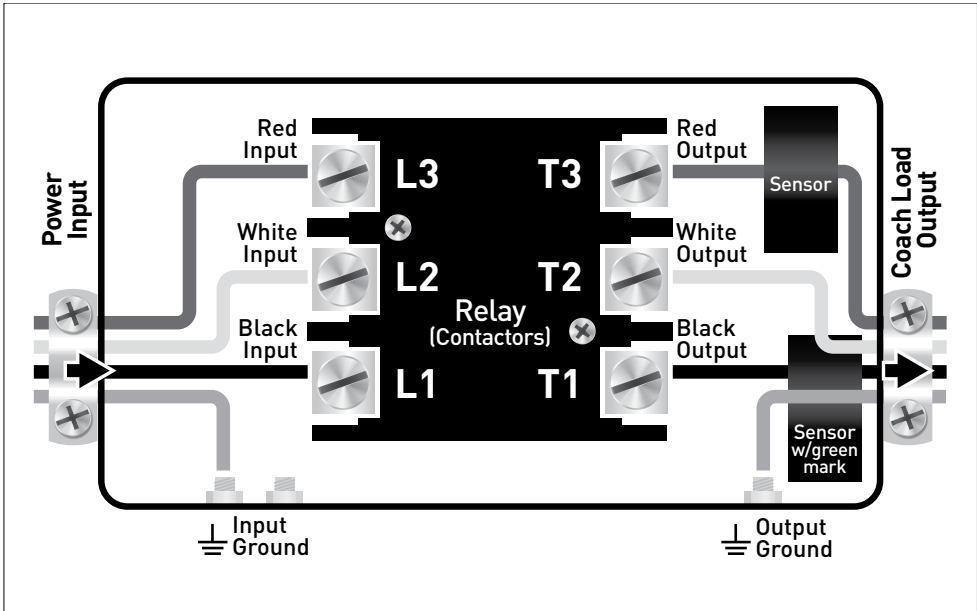


Photo Library for the EMS-HW30C

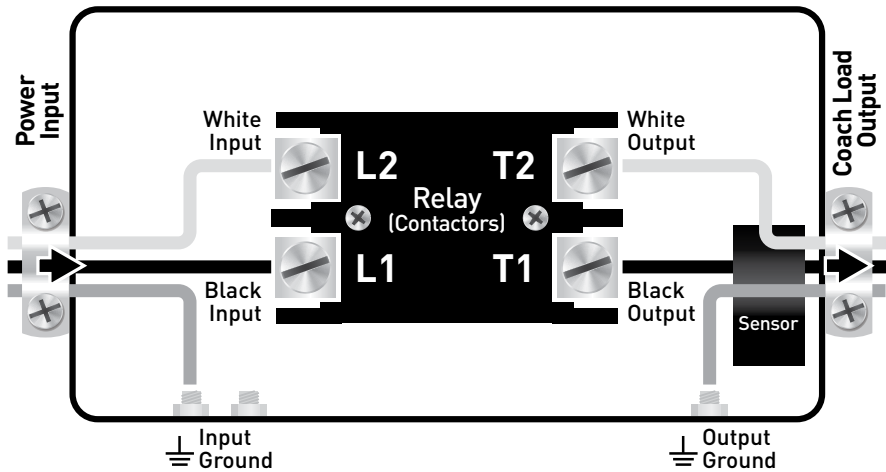




Wiring Diagram for EMS-HW50C



Wiring Diagram for EMS-HW30C





INSTRUCTION MANUAL: **ELECTRICAL MANAGEMENT SYSTEM (EMS)**

Progressive Industries, Inc.

For more information regarding the Limited Lifetime Warranty, Troubleshooting and the Warranty Claim Form visit:

www.progressiveindustries.net

Technical Support

- **800.307.6702**
- tech.progressive@oneasg.com



ENGLISH

CO & Propane Gas Alarm for RVs RVCOLP-2

Propane Gas Alarm for RVs RVL P-2

Owner's Manual

Please Read this Entire Manual Before
Using the RV Safe Alarm

ASSEMBLED IN THE
USA



Key Features

- The latest electro-chemical CO sensing technology
- Bright LEDs to easily demonstrate the alarm's status
- Multi-function button to allow for testing and silencing of unwanted triggering
- 85dB horn to notify occupants of CO and propane gas
- Low power draw (22mA typical)
- Low profile modern design

General Warnings

Carbon monoxide (CO) gases and propane, or liquefied petroleum (LP) can be dangerous. Propane is commonly used in recreational vehicles, and early detection of propane leaks can help prevent dangerous conditions. Carbon monoxide can also accumulate with improper ventilation or with malfunctioning appliances.

CAUTION USING PRODUCTS CONTAINING SILICONE NEAR THE ALARM CAN CAUSE PERMANENT DAMAGE. EXAMPLES INCLUDE: SILICONE ADHESIVES AND CAULK, SILICONE LUBRICANTS, STAIN GUARDS, HAIR CARE, AND GROOMING PRODUCTS.

CAUTION DO NOT COVER OR OBSTRUCT RV SAFE WITH ANYTHING THAT COULD PREVENT GAS FROM ENTERING THE ALARM.

RV Safe will only detect CO and propane gas present at the sensor. Gases may be present in other areas.

WARNING THIS ALARM HAS NOT BEEN DESIGNED TO DETECT SMOKE, FIRE, OR GASES OTHER THAN CARBON MONOXIDE AND PROPANE.

This product is intended for use in recreational vehicles (RVs) only. It is not designed to measure compliance with Occupational Safety and Health Administration (OSHA) commercial or industrial standards.

WARNING TEST ALARM OPERATION AFTER VEHICLE HAS BEEN IN STORAGE, BEFORE EACH TRIP, AND AT LEAST ONCE PER WEEK DURING USE.

Test button tests electrical functions only, not the alarm's ability to detect gases. Carefully test with propane or butane gas for 30 seconds to verify propane sensor function. Be sure that there are no open flames or sources of ignition.

DRY CLOTH CLEAN ONLY TO AVOID DAMAGING YOUR ALARM, CLEAN IT USING A DRY CLOTH ONLY. DO NOT USE LIQUIDS, SPRAYS, OR CHEMICALS OF ANY KIND.

Warnings About Carbon Monoxide Gas

This carbon monoxide alarm is designed to detect carbon monoxide and propane gas from ANY source of combustion. It is NOT designed to detect smoke or any other gases.

Understanding the Dangers of CO Gas Poisoning

The following are the symptoms of carbon monoxide poisoning and need to be discussed with all occupants of the vehicle:

- 1) Mild Exposure:** Slight headache, nausea, vomiting, fatigue ("flu-like" symptoms).
- 2) Medium Exposure:** Severe throbbing headache, drowsiness, confusion, fast heart rate.
- 3) Extreme Exposure:** Unconsciousness, convulsions, cardiorespiratory failure, brain damage, and death. Many cases of reported CARBON MONOXIDE POISONING indicate that while victims are aware they are not well, they become so disoriented they are unable to save themselves by either exiting the building or calling for assistance. Young children and household pets are typically the first affected. If you experience ANY symptoms of CO poisoning, consult your physician.

Potential Problem Sources of CO Gas

The sources of carbon monoxide gas can be very difficult to locate due to the odorless, colorless nature of the gas, especially after the RV has been aired-out prior to the investigator's arrival. Look closely at the following:

- 1) Car idling nearby.
- 2) Motorhome or generator exhaust entering RV.
- 3) Excessive spillage or reverse venting of fuel-burning appliances.
 - Outdoor ambient conditions such as wind direction and/or velocity, including high gusts of wind; heavy air in the vent pipes (cold/humid air with extended periods between cycles).
 - Negative pressure differential resulting from the use of exhaust fans.
 - Simultaneous operation of several fuel burning appliances competing for limited internal air.
 - Vent pipe connection vibrating loose from clothes dryer, furnace, or water heater.
 - Obstructions or unconventional vent pipe designs which amplify the above situations.
- 4) Extended operation of unvented fuel-burning devices (range, oven, fireplace, etc.).
- 5) Temperature inversions which can trap exhaust gases near the ground.
- 6) Poorly designed or maintained vents.

Understanding the Dangers of Propane Gas

Liquefied petroleum (LP) gas is commonly called propane and is used as fuel for heating and cooking appliances, especially for RVs.

Propane gas is explosive at the lower-explosive-limit (LEL), which is 21,000 parts per million (ppm). RV Safe will alarm at 25% LEL, or 5250 ppm.

Propane gas is denser than air, and will usually accumulate close to the floor. Therefore, RV Safe should be placed near the floor in order to quickly detect propane gas leaks.

Alarm Features and Functions

RV Safe includes an 85dB audible horn, two LEDs, and a Silence/Test button. The chart below summarizes the alarm outputs in each state.

Alarm States

State	Green LED	Red LED	Audible Horn
Normal Operation	ON	OFF	OFF
Power Off	OFF	OFF	OFF
Self Test	OFF	ON/Flashing	4 chirps / constant beeps
CO Alarm (RVCOLP models only)	OFF	Flashing	4 chirps
Propane Alarm	OFF	ON	Constant beeps
Alarm Silenced (5 Minutes Max.)	OFF	Flash each second	OFF
Low Battery	Flash each minute	Flash each minute	Chirp each minute
High Voltage	Flash each minute	Flash each minute	Double chirp each minute
End-of-Life or Other Failure	OFF	Double flash each minute	Chirp each minute

Normal Operation State

The green power LED is ON when the alarm is functioning normally and no CO or propane gas is present. Press the Silence/Test button to perform a self test and enter the Test State.

Note: Supply current will remain higher for 3 minutes after power-up. Alarm will not detect CO or Propane for the first 3 minutes and will draw extra current.

Power Off State

If no LEDs are on, then the alarm is powered off. Apply power to the alarm to resume normal operation.

Self Test State

If the Silence/Test button is pressed while in normal operation, the alarm will perform a self test of the CO sensor, propane sensor and battery voltage. It is recommended to perform a self test weekly, after power up from storage, and before each trip. If the self test passes, the alarm will perform 2 cycles of the CO horn pattern (4 rapid chirps followed by a 4 second pause), followed by 2 cycles of the propane horn pattern (constantly beeping). Refer to the Troubleshooting Guide for possible Self Test failures in the next column.

Note: Test button tests electrical functions only, not the alarm's ability to detect gases. Carefully test with propane or butane gas for 30 seconds to verify propane sensor function. Be sure that there are no open flames or sources of ignition.

CO Alarm State (RVCOLP models only)

If CO gas reaches unsafe levels, the alarm will enter CO alarm state. The horn will sound with 4 rapid chirps followed by a 4 second pause and the red LED will flash rapidly. Open windows and doors and turn off appliances. Move to fresh air and call 911. The alarm may be silenced for 5 minutes by pressing the Silence/Test button. Contact a qualified RV technician to diagnose possible causes of CO.

Propane Alarm State

If propane gas exceeds 25% of the lower-explosive-limit for more than 30 seconds, the alarm will enter propane alarm state. The horn will sound with constant beeps and the red LED will be on. Immediately turn off all propane appliances and gas valve at the propane tanks. Open doors and windows to properly ventilate the RV. Check for any gas leaks and contact a qualified RV technician to diagnose possible propane leaks. The alarm may be silenced for 5 minutes by pressing the Silence/Test button.

Alarm Silenced State

A CO alarm or propane alarm can be silenced for up to 5 minutes by pressing the Silence/Test button. The red LED will flash each second while the alarm is silenced. The original alarm state will resume after 5 minutes if the CO or propane levels still exceed safe levels.

Low Battery State

If the supply voltage drops below 9VDC, the alarm will enter Low Battery State. The horn will chirp every minute and both LEDs will flash every minute. Alarm performance cannot be guaranteed as the supply voltage drops below the low battery threshold. Charge or replace the RV battery immediately. **DO NOT DISCONNECT THE ALARM.**

High Voltage

If the supply voltage goes above 17VDC, the alarm will enter a High Voltage State. The horn will double chirp every minute and both LEDs will flash every minute. Alarm performance cannot be guaranteed, and excess voltage may permanently damage the alarm. Please check the power converter or solar output and wiring.

End-of-Life or other Failure State

If the CO or propane alarm fails a self test, or if the End-of-Life is reached (after 5 years of operation), the alarm will enter the Failure State. The horn will chirp every minute and both LEDs will do a double flash every minute. Replace the alarm immediately.

Specifications

Supply Voltage Thresholds	9 to 15 VDC (13.5V nominal)
Supply Current (Max)	88mA at 13.5V / 95mA at 8V
Supply Current (Typical)	22mA at 13.5V
Operating Temperature	-40°F to 150°F (-40°C to 66°C)
Humidity	15% to 90%
CO Detection Thresholds (RVCOLP models only)	70 ppm for 60 to 120 minutes 150 ppm for 10 to 30 minutes 400 ppm for 4 to 15 minutes
LP Detection Threshold	5250 ppm (<25% LEL)
Audible Indicator	85dB at 10 feet (Minimum)
Alarm Lifetime	5 years
Standards (All models)	Conforms to RV Standards for: UL1484
(RVCOLP models only)	UL2034 and complies with CSA 6.19.01
Warranty	1 Year
Weight	1.3 oz
Dimensions	4.21" x 2.61" x 0.57" (10.7 cm x 6.6 cm x 1.4 cm)

Note: Supply current will remain higher for 3 minutes after power-up. Alarm will not detect CO or Propane for the first 3 minutes.



RV SAFE LP/CO DETECTOR

⚠️WARNING ACTIVATION OF YOUR CO ALARM INDICATES THE PRESENCE OF CARBON MONOXIDE (CO) WHICH CAN KILL YOU.

If alarm horn sounds with a 4-chirp pattern (Model RVCOLP-2 only):

- 1) Press the Silence/Test button.
- 2) Call your Local Emergency Services number or 911.

Fill in your local Fire Department number here.

- 3) Immediately move to fresh air – outdoors or by an open door/window. Do a head count to check that all persons are accounted for. Do not reenter the premises or move away from the open door/window until the emergency services responders arrive, the premises have been aired out, and your alarm returns to its normal state.
- 4) After following steps 1 – 3, if your alarm reactivates within a 24 hour period, repeat steps 1 – 3 and call a qualified appliance technician at () to investigate for sources of CO and LP from fuel burning equipment and appliances, and inspect for proper operation of this equipment. If problems are identified during this inspection, have equipment serviced immediately. Note any combustion equipment not inspected by the technician and consult the manufacturers' instructions, or contact the manufacturers directly for more information about CO and LP safety and this equipment. Make sure that motor vehicles are not and have not been operating in an enclosed area near the RV.

Note: This alarm was shipped with two (2) self-adhesive warning labels. Add the telephone numbers of your emergency service provider and that of a qualified technician in spaces provided. Place one label next to the alarm, and the other label near a source of fresh air where your family plans to gather if the alarm indicates the presence of carbon monoxide or propane gas.

⚠️WARNING ACTIVATION OF YOUR PROPANE ALARM INDICATES THE PRESENCE OF PROPANE GAS, WHICH CAN CAUSE AN EXPLOSION AND/OR FIRE. THIS NORMALLY INDICATES A LEAK IN THE PROPANE GAS PIPES OR A PROPANE GAS APPLIANCE.

If alarm horn sounds with constant beeps:

- 1) Evacuate everyone from the RV.
- 2) Shut off propane gas supply at propane tanks or supply.
- 3) Do not touch any electrical switch in or near the RV.
- 4) Do not start vehicle's engine or generator.
- 5) Contact a qualified RV or gas technician for repairs.
- 6) If you cannot reach a gas supplier or qualified Service Technician, contact the local fire department.
- 7) Do not turn on gas supply until the leak has been repaired.

Conditions That Could Adversely Affect Your Alarm

- Exposure to water, splashes, spray, and condensation
- Excessive dust or grease
- Cleaning supplies, chemical sprays, and perfume products
- Do not paint the alarm. Paint can block air flow to the sensor
- Silicone adhesives including hair sprays
- Corrosive liquids such as acids
- Alkaline base metals, like salt spray
- High concentrations of Hydrogen
- Closed interior doors or other obstructions blocking gases from reaching the alarm

⚠️WARNING FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN FAILURE OF THE ALARM AND WILL VOID THE WARRANTY.

Exposure to products containing silicone/silicone vapors can cause permanent damage to the alarm. Exposure to any chemical cleaners or solvents can cause permanent damage to the alarm.

Maintaining Your Alarm

- Verify proper alarm function by pressing the Silence/Test button after storage, before every use and once per week during extended use.
- Vacuum the alarm with a soft brush attachment to remove dust monthly.

Troubleshooting Guide

Please refer to the alarm states chart and description for most common issues. Use the chart below to diagnose any self test failure:

Self Test Results

Result	Alarm Output	Action
CO or Propane Failure or End-of-Life	Long beep with red LED blinking	Replace alarm
Low Battery	Long beep with red and green LED on solid	Charge or replace RV battery

WARNING! Limitations of CO and Propane Gas Alarms

CO and propane alarms have been proven to be both effective and reliable, but they may not be effective under all conditions. No alarm/sensor design can offer total protection of life and property. A CO and/or propane alarm is not a substitute for an adequate homeowner's property insurance or life insurance policy.

WARNING - This product is intended for use in ordinary indoor locations of recreational vehicles (RVs). It is not designed to measure compliance with Occupational Safety and Health Administration (OSHA) commercial or industrial standards.

CO and propane alarms will not work without a source of power. The alarm will not operate nor sound if the power source is low or disconnected.

CAUTION - This CO alarm will only indicate the presence of carbon monoxide gas near the sensor. Carbon monoxide gas may be present in other areas of the RV.

Alarm warning signals may not be heard. A deep sleeper, hearing-impaired person, young child or someone impaired by drugs or alcohol may not awaken in response to a alarm activation. This can occur even when an alarm is located inside the individual's bedroom. Make sure emergency exit drills are practiced that take this possibility into account.

CO sensors may not always activate and provide early enough warning. A CO sensor will only activate when it is maintained in working order and sufficient amounts of CO gas reaches the unit.

If the RV will be used in areas where external CO sources such as portable generators or idling vehicles might be present, it is recommend that the RV's owner install additional CO alarms in the RV.

Individuals with medical problems may consider using warning devices which provide audible and visual signals for carbon monoxide concentrations under 30 ppm.

This device is designed to protect individuals from the acute effects of carbon monoxide exposure. It will not fully safeguard individuals with specific medical conditions. If in doubt, consult a medical practitioner.

WARNING - The installation of CO alarms should not be used as a substitute for proper installation, use, and maintenance of fuel-burning appliances, including appropriate ventilation and exhaust systems.

CO ALARMS CANNOT GUARANTEE THAT YOU WILL NEVER SUFFER ANY ILLNESS OR INJURY FROM EXPOSURE TO CARBON MONOXIDE GAS.

Installing Your RV Safe Alarm

⚠️WARNING DO NOT INSTALL IN A POWER LINE CONTROLLED BY A WALL SWITCH OR GFI CIRCUIT.

Connecting Power

Disconnect power until installation is completed to avoid shorting. RV Safe should be powered from the RV's 12VDC system connected to a properly fused circuit. Connect the red and black wires to the RV battery using an appropriate fuse (recommend using a 1A Min., 15A Max. fuse). Connect wires with automotive or UL recognized wire connectors.

Location — DO INSTALL

- In the kitchen area near potential gas leaks such as a stove, oven, refrigerator, or furnace.
- Within 4"-18" (10cm-46cm) of the floor. Propane is heavier than air and will settle near the floor. CO gas is approximately the same density as air, and will mix evenly.
- Where alarm vents are unobstructed to airflow; away from furniture, curtains, and out of closets.

Location — DO NOT INSTALL

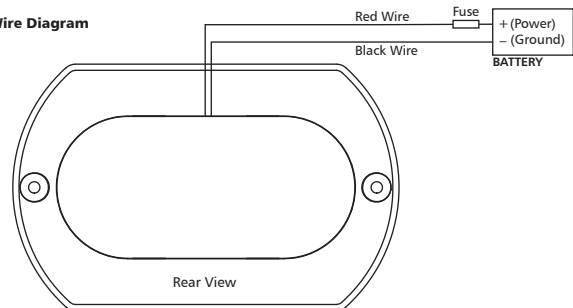
- Within 12" (30cm) of opening windows, exterior doors, fans, vents, or areas with a draft.
- On an exterior wall.
- Within 24" (61cm) of any cooking appliance.
- Behind furniture, drapes, in closets or areas that will block gas flow to alarm.
- On a power line controlled by a wall switch.

Mounting

RV Safe should be mounted on a wall or panel of the RV.

1. Ensure there is clearance for the wires and mounting screws behind the wall or panel.
2. Drill a 5/8" (16mm) hole for the wires to exit the alarm through the wall. Note that this hole is NOT the center of the alarm.
3. Disconnect power from the 12VDC system being connected.
4. Connect the wires of the alarm to the corresponding wires of the 12VDC system. The black wire of the alarm should be connected to ground, and the red wire connected to 12VDC power.
5. Route the power wires of the alarm through the hole.
6. Screw alarm to wall.

Wire Diagram



Limited Warranty

For a period of 12 months from the date of purchase, RV Safe LLC warrants to you, the original purchaser, that your RV Safe alarm will be free from defects in workmanship, materials, and construction under normal use and service. If a defect in workmanship, materials, or construction should cause your RV Safe alarm to become inoperable within the warranty period, RV Safe LLC will furnish you with a new or rebuilt replacement alarm without charge to you except for your costs of shipping the alarm to RV Safe LLC for warranty coverage. Your repaired or replacement RV Safe alarm will be returned to you without charge and will be covered under this warranty for the balance of the warranty period.

This warranty will not apply if inspection of your RV Safe alarm shows that the damage or failure was caused by abuse, misuse, abnormal usage, faulty installation, improper maintenance, or work other than that performed by authorized service personnel.

Any warranties implied under any State law, including implied warranties of merchantability and fitness for a particular purpose, are limited in duration to the period of this limited warranty. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. RV Safe LLC will not be liable for any loss, damage, incidental or consequential damages of any kind arising in connection with the sale, use, operation, inoperability, malfunction, or repair of your RV Safe alarm. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

Replacement

Replace 5 years after install.

Do not disconnect until new alarm is ready to install.

Date of Installation: _____

Replacement Date: _____

Note: The replacement date that appears on the device is the date beyond which the device may no longer detect carbon monoxide accurately and should be immediately replaced.

Alarm Returns

For replacement under terms of this Warranty, contact customer service at:

CustomerService@RVSafeAlarm.com

or at

www.RVSafeAlarm.com/CustomerService

If a defect in workmanship, materials, or construction should cause your RV Safe alarm to become inoperable within the warranty period, to obtain warranty coverage you must ship the alarm to RV Safe LLC, with shipping costs prepaid by you. You must also pack the RV Safe alarm to minimize the risk of it being damaged in transit. You must also enclose a return address. RV Safe alarms returned for warranty service should be sent to: RV Safe LLC - Returns Dept, 11441 Markon Dr., Garden Grove, CA 92841, accompanied by proof of purchase.

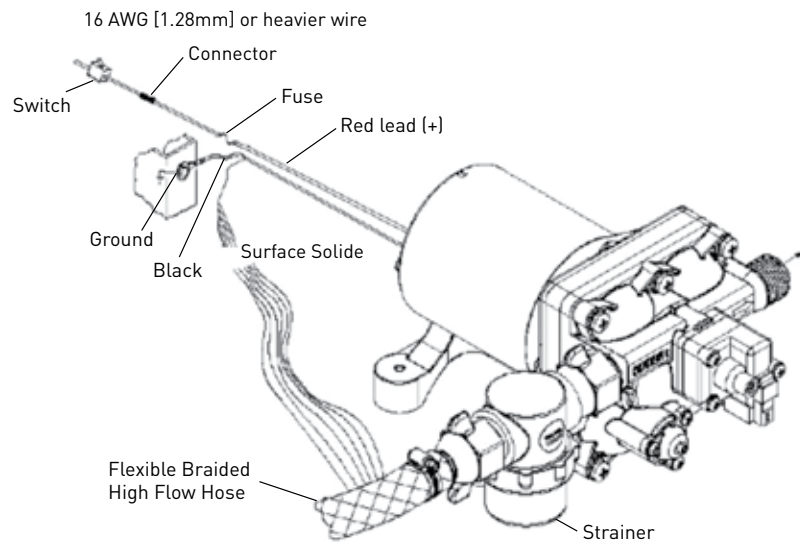
If RV Safe LLC receives an alarm in a damaged condition as the result of shipping, you will be notified and you may need to file a claim with the shipper.

This Limited Warranty gives you specific legal rights, and you may also have other rights which vary from state to state. This is your copy of the Limited Warranty on your RV Safe alarm. Please retain it, along with proof of purchase showing the date of purchase and the identity of the purchaser, in a safe place.



SHURFLO® 4008 RV REVOLUTION™ BY-PASS PUMP

INSTALLATION & OPERATION MANUAL



Typical Pump Installation

INSTALLATION GUIDELINES

- Solid Surface within 6' of tank.
- Minimize flow restrictions in the system.
- No Accumulator needed.
- Flexible hose on inlet and outlet.
- Minimize plumbing elbows and valves.
- Accessible location.
- Strainer on pump inlet.
- Properly Sized wiring.
- Properly electrical protection.
- Properly sized plumbing.

INSTALLATION PREPARATION

The goal of installation is to provide a quiet, easy-to-maintain installation with good flow and low backpressure. This can be accomplished with the following guidelines:

- Mount on a **solid surface** in an **accessible location** for strainer cleaning and pump maintenance.
- 1/2" Male threaded models are intended to be used with SHURFLO swivel barb fittings which seal with an internal taper when hand tightened. **CAUTION:** Sealers and Teflon tape may act as lubricant causing cracked housings or stripped threads due to over-tightening. Sealer may enter the pump inhibiting valve action, causing no prime or no shut-off. A failure due to foreign debris is not covered under warranty.
- Use **flexible high-pressure hose** on the pump inlet and outlet [such as **SHURFLO Kit 94-591-01**]. The pumps ports and **strainer should not be connected to plastic or rigid pipe, or the pump's normal motion will transmit through rigid plumbing causing noise, and possibly loosening or cracking components.**

■ Pump must use an adequate 50-mesh strainer [such as SHURFLO 255 series strainers].

■ Use a minimum of **1/2" [13mm] Inner Diameter** plumbing. Smaller ID plumbing will cause cavitation, high back pressure, low flow and noise.

■ **No need for an accumulator** with by-pass pumps.

■ Pump is designed for **intermittent duty** only: Do not use these pumps for running a Reverse-Osmosis [RO] Filtration System. High pressure-continuous duty usage will shorten the life of the pump and is not covered under warranty.

■ Wire Size is 16 GA **MINIMUM**, 12GA is recommended—**See Wire Chart** in Electrical Section for minimum sizing.

■ Minimum power requirement is a 10 Amp circuit.

■ **Reduce restrictions on inlet and outlet.** This includes small inner diameter shut-off valves, winterizing valves and elbows.

■ If the RV has an **Intellitec Pump Controller**, it must be rated at 10 or 15 amps; If the controller is rated at 7.5 Amps, a new controller or a high-amp relay must be used.

MOUNTING

- Mount the pump within 6 feet of the tank for best performance and pump life. The pump will pull farther, but the farther it pulls the more work it does, increasing vibration and noise, and reducing the output and pump life.
- Mount pump in a space of at least 1 cubic foot for adequate ventilation to prevent overheating.
- Pump may be mounted in any position.
- Mount pump for easy access for cleaning strainer, maintenance and service.
- Mount pump on a solid surface to prevent vibration and noise.



ELECTRICAL

■ The pump works best on an individual filtered circuit, protected by the recommended fuse or breaker specified on the label.

■ A 15-Amp switch is recommended and should be on the positive lead (red wire).

■ Wire Sizing: Proper wire sizing is required for good pump operation. If the wire is too small, low voltage will affect the pump performance and can create a fire hazard. **SHUT OFF POWER TO THE PUMP WHEN LEAVING THE RV UNATTENDED.**

Ft. [m]		AWG [mm ²]	
0-25	[0-7.6]	16	[1.3]
25-50	[7.6-15.2]	14	[2.1]
50-70	[15.2-21.3]	12	[3.3]
70-110	[21.3-33.5]	10	[5.3]

Minimum Wire Size for a 10% voltage drop on a 12VDC, 15 Amp Circuit. Length is the distance from the power source to pump and back to ground.

PLUMBING

Installation of a strainer is required to prevent debris from entering the pump. For noise and vibration reduction we recommend at least 18 in. [4.5 M] of 1/2" [13mm] I.D. flexible high-pressure hose to both ports. The pump ports and strainer **should not** be connected to plastic or rigid pipe. This hose should be anchored where it meets the hard plumbing to reduce plumbing vibration.

OPERATION

This pump is designed for intermittent duty only. The pump operates normally up to about 40-psi, where a spring-loaded by-pass valve opens, allowing flow back from the output side to the input side, providing smooth, steady flow with virtually no cycling, all the way down to a trickle. As a faucet is opened back up, the pressure will drop, the by-pass will close and full flow is again obtained. This allows good flow, even with today's restrictive showers and pullout sprayer faucets. Performance will vary, of course, depending on the voltage to the pump; lower voltage = lower flow, higher voltage = higher flow. Remember your electrical safety: It is always best to shut power to the pump OFF when leaving the RV unattended.

2

ABOUT THE BY-PASS

NOTE: By-pass adjustment should only be performed by a professional technician with proper gauges and equipment.

The by-pass is a spring loaded diaphragm that opens up allowing water from the discharge side back to the inlet side. The by-pass is set to begin opening at about 40 psi and creating full by-pass at about 62 psi (lower pressure pumps will vary depending on the by-pass and pressure shut-off settings). The pressure switch on the pump is set to shut off at 55 psi. If the switch or by-pass are adjusted too much, the by-pass and switch shut-off can overlap and **THE PUMP WILL NOT SHUT OFF**. Screw-

ing the switch screw in clockwise will raise the shut-off pressure. Unscrewing the switch screw counterclockwise will lower the pump shut-off pressure. Screwing the by-pass screw in will raise the pressure at which the by-pass starts and raise the full by-pass pressure. Unscrewing the by-pass screw counterclockwise will lower the pressure at which by-pass starts and lower the full by-pass pressure.

WARNING: If full by-pass is reached before the shut-off setting, the pump will not shut off. Full by-pass pressure setting should be at least 10 psi higher than pump shut off pressure.

SANITIZING

Potable water systems require periodic maintenance to keep components working properly and deliver a consistent flow of fresh water. Sanitizing is recommended: prior to storing, after a period of storage, or any time the system is opened or contaminated, as follows:

NOTE: Check your Vehicle Owner's Manual for specific instructions. By-pass any filters or remove filter cartridges.

1. Determine the amount of common household bleach needed to sanitize the tank.

A) 2 ounces of bleach per 15 gallons tank size: 60 gallon tank [15 x 4] = 4 x 2 ounces = 8 ounces of bleach.

B) 1 ml bleach per 1 liter tank size: 300 liter tank = 300 milliliters of bleach.

2. Mix the bleach with water in a container such as a gallon jug. If tank is filled through a pressurized fitting, pour the bleach into the hose before attaching the hose to the city water entry.

3. Pour the bleach solution into the tank and fill the tank with potable water. Rock the RV back and forth to coat top and sides of potable water tank.

4. Open all faucets (Hot & Cold) allowing the water to run until the odor of chlorine is detected. Allow four (4) hours of contact time to disinfect completely. Doubling the solution concentration allows for a contact time of one (1) hour.

5. Drain the tank. Refill the tank and flush the system once or twice until the odor has decreased. The residual chlorine odor and taste is not harmful.

WINTERIZING

Refer to the vehicle owner's manual for specific winterizing instructions.

If water is allowed to freeze in the system, serious damage to the plumbing and pump may occur. Failures of this type will void the warranty. The best guarantee against damage is to completely drain the pump and perform the following:

1. Drain the water tank. If the tank doesn't have a drain valve, open all faucets allowing the pump to operate until the tank is empty.

2. Open all the faucets (including the lowest valve or drain in the plumbing), allow the pump to purge the water from the plumbing, and then turn the pump OFF.

3. Using a pan to catch the remaining water, remove the plumbing at the pump's inlet/outlet ports. Turn the pump ON, allowing it to operate until the water is expelled. Turn OFF power to the pump once the plumbing is emptied. Do not reconnect the pump plumbing. Make a note at tank filler as a reminder: "Plumbing is disconnected".

4. All faucets must be left open to guard against any damage.

5. Potable anti-freeze may be poured down drains and toilets to protect p-traps and toilet seals. Sanitize the plumbing system before putting the plumbing system back in service.



TROUBLESHOOTING

Vibration induced by driving can loosen plumbing, strainers and pump hardware. Check for system components that are loose. Also, refer to the chart below for trouble-shooting tips.

PUMP WILL NOT START/ BLOWS CIRCUIT

- ✓ Electrical connections, fuse or breaker, main switch, and ground connection.
- ✓ Is the motor hot? Thermal breaker may have triggered; it will reset when cool.
- ✓ Is voltage present at the switch? Bypass pressure sw. Does the pump operate?
- ✓ Charging System for correct voltage ($\pm 10\%$) and good ground.
- ✓ For an open or grounded circuit, or motor; or improperly sized wire.
- ✓ For seized or locked diaphragm assembly [water frozen?].

WILL NOT PRIME/SPUTTERS (No discharge/Motor runs)

- ✓ Is the strainer clogged with debris?
- ✓ Is there water in the tank, or has air collected in the hot water heater?
- ✓ Is the inlet tubing/plumbing sucking in air at plumbing connections (vacuum leak)?
- ✓ Is inlet/outlet plumbing severely restricted or kinked? Restrictive valves?
- ✓ Proper voltage with the pump operating ($\pm 10\%$).
- ✓ For debris in pump inlet/outlet valves or swollen/dry valves.
- ✓ Pump housing for cracks or loose drive assembly screws.

RAPID CYCLING

- ✓ For restrictive plumbing and flow restrictions in faucets/shower heads.
- ✓ Water filter/purifier should be on separate feed line.
- ✓ Shut-off pressure set too low.

PUMP WILL NOT SHUT-OFF / RUNS WHEN FAUCET IS CLOSED

- ✓ Output side (pressure) plumbing for leaks, and inspect for leaky valves or toilet.
- ✓ For air trapped in outlet side (water heater) or pump head.
- ✓ For correct voltage to pump ($\pm 10\%$).
- ✓ For loose drive assembly or pump head screws.
- ✓ Are the valves held open by debris or is the rubber swollen?
- ✓ Pressure switch operation. By-pass set higher than shut-off.

NOISY OR ROUGH OPERATION

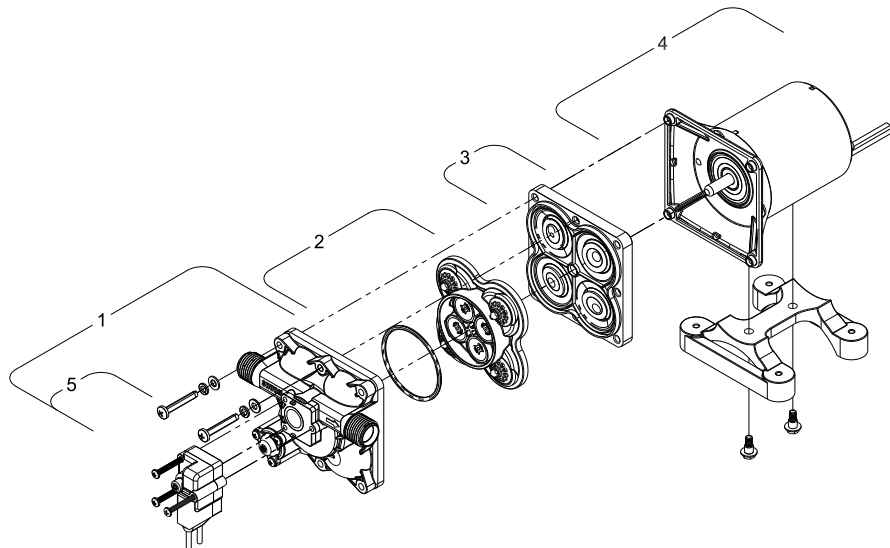
- ✓ For plumbing which may have vibrated loose.
- ✓ For a restricted inlet [clogged strainer, kinked hose, restrictive valves].
- ✓ Is the pump plumbed with rigid pipe causing noise to transmit?
- ✓ Does the mounting surface amplify noise [flexible]? Does it bang like a drum?
- ✓ For mounting feet that are loose or are compressed too tight.
- ✓ For air in the system. Check all fixtures for air and bleed system.
- ✓ The motor with pump head removed. Is noise from motor or pump head?

LEAKS FROM PUMP HEAD OR SWITCH

- ✓ For loose screws at switch or pump head.
- ✓ Switch diaphragm ruptured or pinched.
- ✓ For punctured diaphragm if water is present in drive assembly.

MAINTENANCE

Normal pump maintenance is all that is needed: Checking and cleaning of the strainer, normal sanitizing and winterizing and occasionally checking all plumbing hardware and fittings for tightness. Lack of sanitizing is the number one reason for premature pump failure and poor performance over time. Lack of sanitizing will cause scale build-up on the diaphragm and valves, causing low flow and leak back [occasional pump cycling with no faucets open or tank filling up when hooked up to city water].



REPAIR KITS

ITEM	COMPONENT	PARTS KIT
1, 5	Upper Assembly	94-800-00
2	Valve Assembly	94-800-01
3	2.5" Drive Assembly	94-800-02
4	Motor	94-11-302-00
N/S	Check Valve	94-800-03
1, 2, 3, 5	Pump Head	94-800-04
N/S	Pressure Switch	94-800-05



SHURFLO WATER PUMP



FLOW MANAGEMENT SOLUTIONS

3545 HARBOR GATEWAY SOUTH, SUITE 103, COSTA MESA, CA 92626, (800) 854-3218 WWW.SHURFLO.COM

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INSTALLATION AND OPERATION MANUAL



DIRECT VENT GAS WATER HEATER

MODELS

SW6D • SW6DE • SW6DM • SW6DEM



FOR INSTALLATION IN RECREATIONAL VEHICLES AND MOBILE HOUSING

FOR YOUR SAFETY

WHAT TO DO IF YOU SMELL GAS

- DO NOT TRY TO LIGHT ANY APPLIANCE.
- DO NOT TOUCH ANY ELECTRIC SWITCH: DO NOT USE ANY PHONE IN YOUR VEHICLE.
- IMMEDIATELY CALL YOUR GAS SUPPLIER FROM A NEIGHBOR'S PHONE. FOLLOW THE GAS SUPPLIER'S INSTRUCTIONS.
- IF YOU CANNOT REACH YOUR GAS SUPPLIER, CALL THE FIRE DEPARTMENT.

FREEZE WARNING

DRAIN HEATER IF SUBJECT TO FREEZING TEMPERATURES.

WARNING: IMPROPER INSTALLATION, ADJUSTMENT, ALTERATION, SERVICE OR MAINTENANCE CAN CAUSE INJURY OR PROPERTY DAMAGE. REFER TO THIS MANUAL. FOR ASSISTANCE OR ADDITIONAL INFORMATION, CONSULT A QUALIFIED INSTALLER, SERVICE AGENCY OR THE GAS SUPPLIER.

FOR YOUR SAFETY

DO NOT STORE OR USE GASOLINE OR OTHER COMBUSTIBLE MATERIALS OR LIQUIDS NEAR OR ADJACENT TO THIS HEATER OR ANY OTHER APPLIANCE. THIS APPLIANCE SHALL NOT BE INSTALLED IN ANY LOCATION WHERE FLAMMABLE LIQUIDS OR VAPORS ARE LIKELY TO BE PRESENT.

AN ODORANT IS ADDED TO THE GAS USED BY THIS WATER HEATER.

INSTALLER: AFFIX THESE INSTRUCTIONS TO OR ADJACENT TO WATER HEATER.

OWNER: RETAIN THESE INSTRUCTIONS AND WARRANTY FOR FUTURE REFERENCE.

ALL TECHNICAL AND WARRANTY QUESTIONS SHOULD BE DIRECTED TO THE COMPANY LISTED ON THE WARRANTY, OR RATING PLATE WHICH CAME WITH YOUR WATER HEATER.



SUBURBAN MANUFACTURING COMPANY
676 Broadway Street
Dayton, Tennessee 37321
423-775-2131
Fax: 423-775-7015



INSTALLATION REQUIREMENTS

WARNING! Installation of this appliance must be made in accordance with the written instructions provided in this manual. No agent, representative or employee of Suburban or other person has the authority to change, modify or waive any provision of the instructions contained in this manual.

CAUTION: If possible, do not install the water heater to where the vent can be covered or obstructed when any door on the trailer is opened. If this is not possible, then the travel of the door must be restricted in order to provide a 6" minimum clearance between the water heater vent and any door whenever the door is opened.

CAUTION: Due to the differences in vinyl siding, this appliance should not be installed on vinyl siding without first consulting with the manufacturer of the siding or cutting the siding away from the area around the appliance vent.

CAUTION: In any installation in which the vent of this appliance can be covered due to the construction of the RV or some special feature of the RV such as slide out, pop-up etc., always insure that the appliance cannot be operated by setting the thermostat to the positive "OFF" position and shutting off all electrical and gas supply to the appliance.

CAUTION: Do not install this appliance to where the vent terminates below a slide-out. This appliance is not to be installed under any overhang. It must be free and clear of any type overhang.

This installation must conform with the requirements of the authority having jurisdiction or in the absence of such requirements with the latest edition of the National Fuel Gas Code ANSI Z223.1; and the latest edition of the American National Standard for Recreational Vehicles-501C. In Canada the installation should conform with the following standards.

A. For installation in Recreational Vehicle

1. Gas - CSA standard CSA Z240.4.2 Installation Requirements for Propane Appliances and Equipment in Recreations Vehicles.
2. Electrical - CSA standard C22.2 No. 148/Z240.6.2 Electrical Requirements for Recreational Vehicles.
3. Plumbing - CSA standard CSA Z240.3.2 Plumbing Requirements for Recreational Vehicles.

B. For installation in Mobile Housing

1. Gas - CSA standard CSA Z240.4.1 Installation Requirements for Gas Burning Appliances and Equipment in Mobile Homes.
2. Electrical - CSA standard CSA C22.1 Canadian Electrical Code Part 1.
3. Plumbing - CSA standard CSA Z240.3.1 Plumbing Requirements for Mobile Homes.

The appliance shall be disconnected from the gas supply piping system during any pressure testing of the system.

The appliance and its gas connections shall be leak tested before placing the appliance in operation.

All air for combustion must be supplied from outside the structure. Air for combustion must not be supplied from occupied spaces.

INSTALLATION INSTRUCTIONS

Minimum clearance from combustible construction on sides, top, floor and rear = 0 inches. Provide room for access to rear of heater for servicing.

Provide an opening flush with floor in outer wall of coach as shown. Wall of coach should be framed as shown in Figure 1. Maintain inside dimensions listed below. Do not install on carpet unless the carpet is covered by a metal or wood shield covering the entire area underneath the water heater. If you prefer, you may cut away the carpet from this area.

INSTALLATION USING FLUSH MOUNT FRAME & DOOR

(See Figure 2 for Illustration)

A. Position heater into framed opening as illustrated. Slide unit into opening until the front of the control housing is flush with the exterior coach skin.

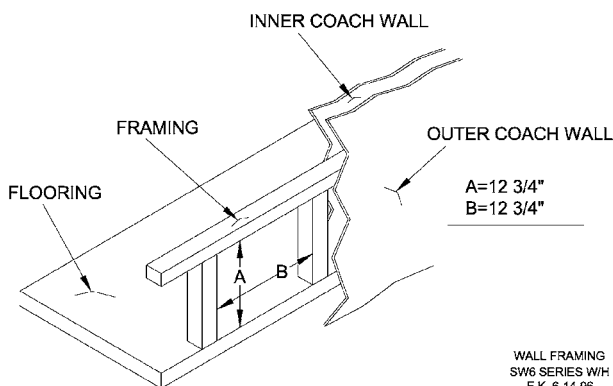


Figure 1

WALL FRAMING
SW6 SERIES W/H
F.K. 6-14-96

B. Secure the control housing to the coach wall (framed opening) at the top and sides of control housing compartment using screws or other suitable fasteners. Recess the screws or fasteners back far enough from the front edge of control housing (approximately 1 1/2") in order to clear the flange on door frame. The door frame, when installed, must not overlap onto screw or other fastener head. If due to the wall thickness, it is not possible to secure the water heater without covering the fastener head with the door frame, it is important to not over tighten the fastener and distort the control housing. Over tightening of the fastener may cause water heater leaks between the control housing and the door frame.

NOTE: Caulk around screw or fastener heads to assure water tight seal.

C. Install chocks, one on each side of water heater, as illustrated in Figure 1A.

D. On mesa or yoder type sidewalls, flatten the wall area around the opening.

E. Caulk around framed opening (trailer skin) as illustrated.

F. Caulk around door frame using 2 beads of silicone caulking (or suitable caulking) - one on flange to seal to control housing and one around back side of frame to seal to coach skin. (See detail A in illustration.)

G. Insert door frame into control housing and secure with three (3) No. 8-15 x 3 1/2" screws provided.

H. To install door, place the two holes in the bottom of the door over the door pins on the frame. Close the door so that the latch protrudes through the slot in the door. Turn latch 90 degrees to fasten door.

I. The module board on models SW6D and SW6DE is not secured to the water heater. It is to be permanently mounted by the installer.

The module board must be mounted to where it is accessible for service yet out of way of children. It should be located in a place where it cannot be subjected to moisture, cleaning chemicals, flammable vapors and liquids, etc.

The board and all wiring to the board must be protected in order to prevent damages and accidental contact with these parts. The module board may be mounted with two (2) No. 6 x 5/8 screws or other suitable hardware.

INSTALLATION USING HINGED DOOR

(See Figure 3 for illustration)

A. Position heater into framed opening as illustrated.

B. On mesa or yoder type sidewalls, flatten the wall area around the opening.

C. Caulk around framed opening (trailer skin) as illustrated.

D. Lay a bead of silicone caulking (or suitable caulking) around the inner edge of the control housing (top, bottom and sides). See detail "A" in illustration. This will seal frame to control housing.

E. Apply a bead of silicone caulking (or suitable caulking) around back side of door frame. See detail "A" in illustration. This will seal frame to coach skin.

F. Fit the door frame into control housing (over the caulking already applied) and pull frame tight to control housing using the three (3) No. 8-15 x 3 1/2" screws provided.

G. Push water heater into framed opening until back side of door frame (now attached to control housing) is against the side of the coach and firmly attach with screws around the perimeter of the frame. **NOTE:** The two (2) holes in bottom of frame identified as "A" in Figure 3 are also used to mount door hinge to the frame.

H. Install chocks, one on each side of water heater, as illustrated in Figure 1A.

I. Attach door to frame as illustrated.

J. Close the door so that the door latch protrudes through the slot in the door. Turn latch 90 degrees to fasten door.

K. The module board on models SW6D and SW6DE is not secured to the water heater. It is to be permanently mounted by the installer.

The module board must be mounted to where it is accessible for service yet out of way of children. It should be located in a place where it cannot be subjected to moisture, cleaning chemicals, flammable vapors and liquids, etc.

The board and all wiring to the board must be protected in order to prevent damages and accidental contact with these parts. The module board may be mounted with two (2) No. 6 x 5/8 screws or other suitable hardware.

WATER HEATER AS VIEWED FROM INSIDE R.V.

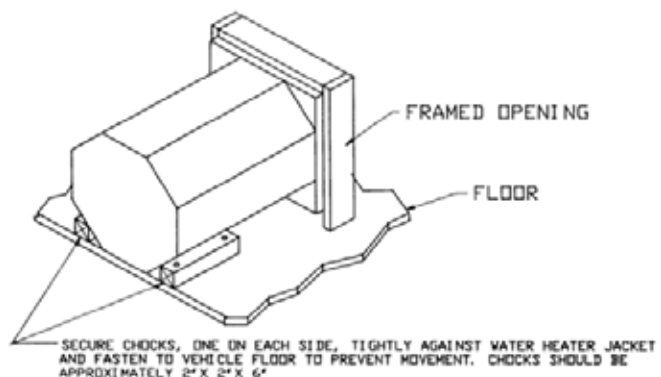


Figure 1A

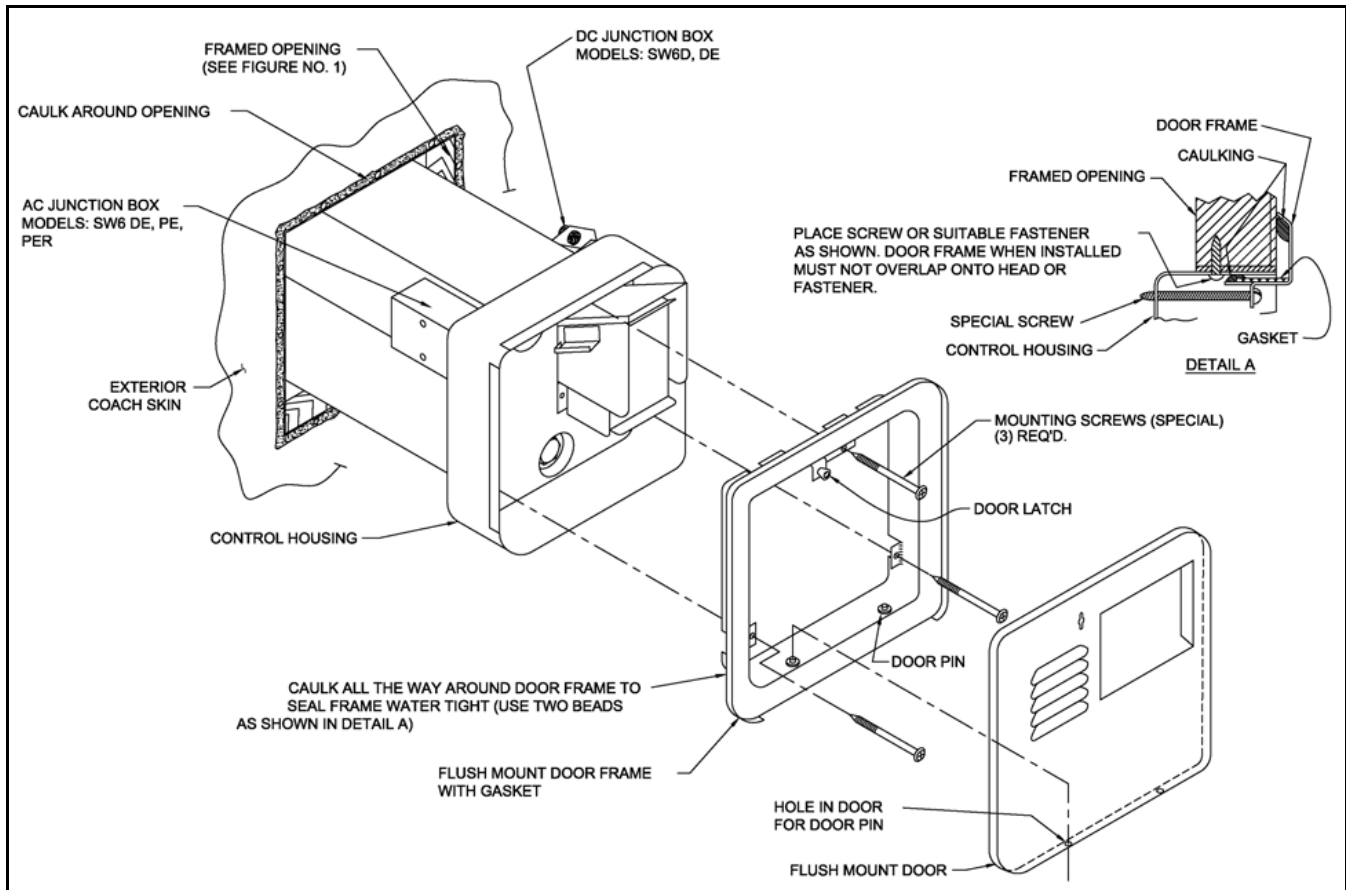


Figure 2

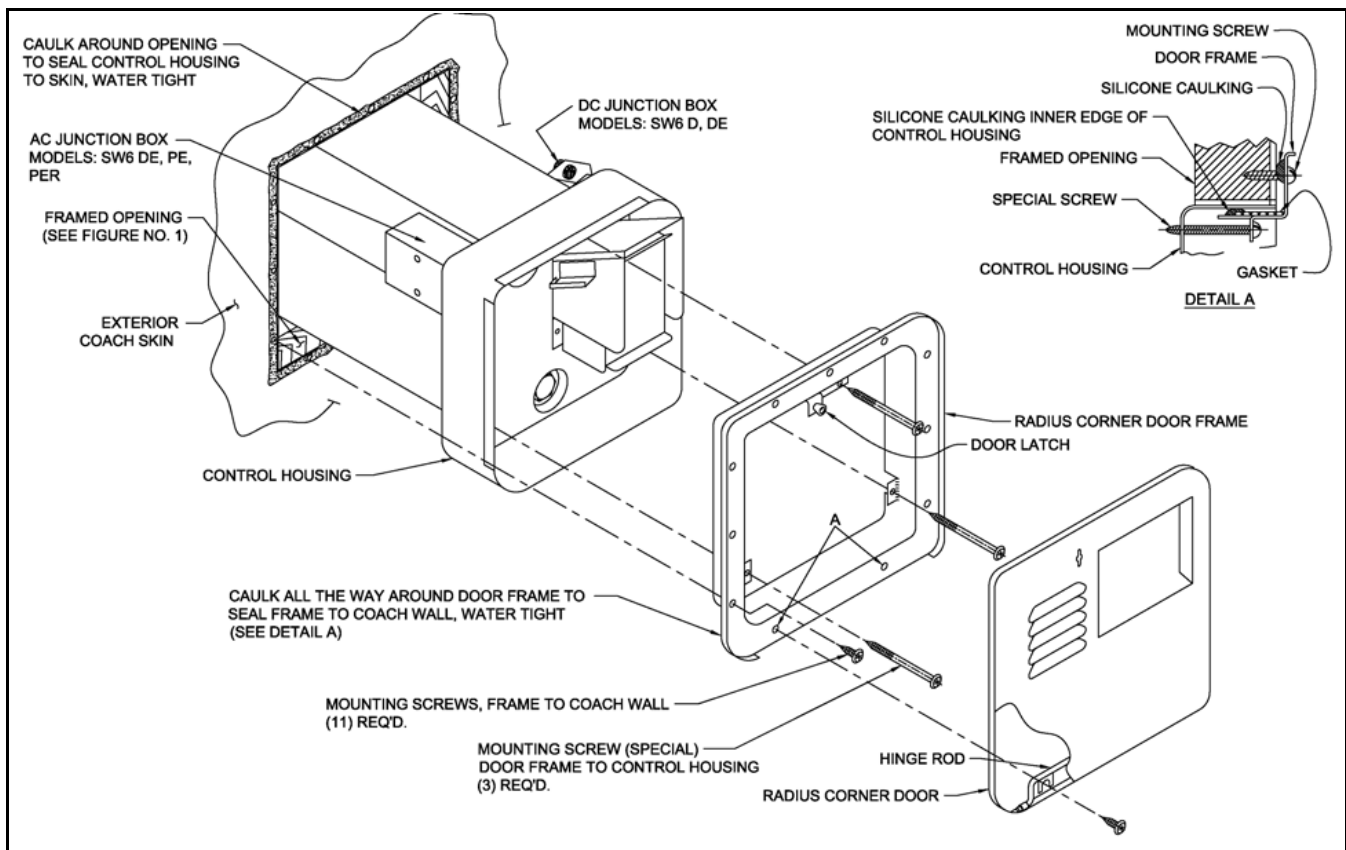


Figure 3



MAKING WATER CONNECTIONS

A. Water connections are made at the rear of the water heater. Refer to Figure 4 for all models except SW 6DM and SW 6DEM. For SW 6DM and SW 6DEM, refer to Figure 5 or 6. Connect the hot and cold water lines to the 1/2" female pipe fitting provided on rear of tank. These fittings are marked "HOT" and "COLD". NOTE: Inside each fitting is a plastic fill tube. Its purpose is to enhance water circulation. **DO NOT REMOVE PLASTIC FILL TUBE.**

IMPORTANT: Use a pipe thread compound suitable for potable water or pipe thread tape on all connections to assure they will not leak.

B. For ease of removal, it is suggested that a pipe union be installed in each water line.

C. Fill tank with water. Open both hot and cold water faucets to expel air from tank. When tank is filled and water flows from faucets, close both faucets and check all connections for leaks.

CAUTION: If you use air pressure to check for leaks, the pressure must not exceed 30 PSI (in accordance with 4-9.1.1 of ANSI A119.2).

NOTE: After leak testing, drain water from tank.

MAKING GAS CONNECTIONS

A. Connect a 3/8" gas supply line to the 3/8 flare fitting at gas valve located in the control housing. When making the gas connection, hold the gas fitting on the valve with a wrench when tightening the flare nut. Failure to hold fitting secure could result in a gas leak due to fitting being damaged. NOTE: It will be necessary to remove the grommet from the control housing, make the gas connection at the valve, then reinstall grommet.

WARNING! It is imperative that grommet and gas line through grommet be caulked air tight. If not tightly sealed, moisture and potential harmful flue products could vent through opening and into living area of trailer. (See Figure 7.)

B. Turn on gas and check all fittings and connections for leaks, using a soap and water solution. Correct even the slightest leak immediately.

WARNING! Do not use an open flame to check for leaks!

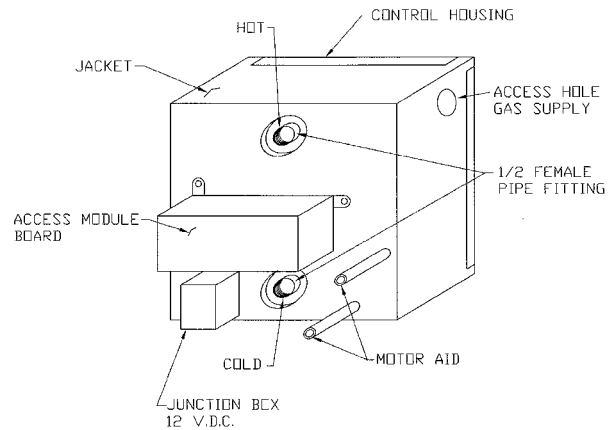
HIGH ALTITUDE DERATION

Suburban water heaters are certified by nationally recognized testing laboratories for operation without modifications at altitudes up to 4,500 feet. Operation above this elevation may require derating by 4 percent for every 1,000 feet above sea level. For example, at 8,000 feet, the water heater should be derated approximately 32 percent.

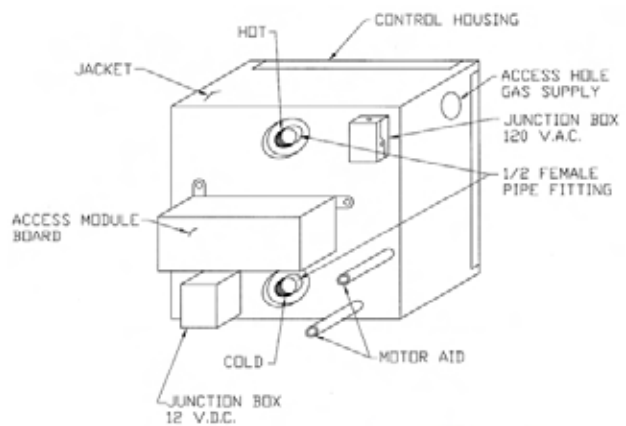
If the unit is not properly derated, lack of sufficient oxygen for combustion may produce improper burner operation. Pilot outage caused by burner lift-off or sooting from a yellow burner may occur indicating the possibility of carbon monoxide. You may also notice a lack of efficiency in heating the water because of incomplete combustion of the burner at these higher altitudes.

Consult with the local gas company, your dealer, an RV service agency or Suburban Manufacturing Company for proper derating of the unit. Change-out of the orifice (derating) should be done by the dealer or a qualified service agency.

NOTE: It is important that once the unit has returned to lower elevation (below 4,500 feet), this high altitude deration and pilot adjustments (if equipped) be reversed for proper operation of the unit.



**Model SW6DM
Figure 5**



**Model SW6DEM
Figure 6**

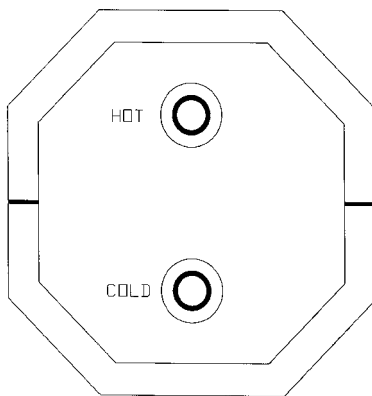


Figure 4

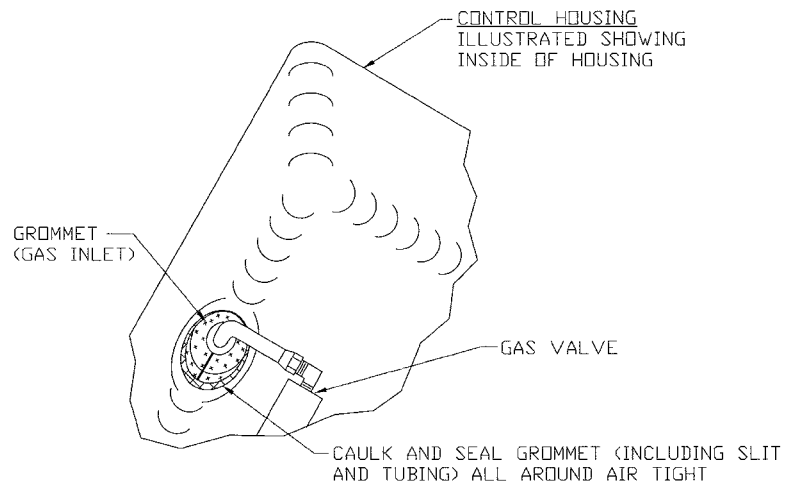


Figure 7



MAKING ELECTRICAL CONNECTIONS 12 VOLTS D.C.

- A. Applicable to following models: SW6D, SW6DE, SW6DM and SW6DEM.
- B. Refer to Figure 2 for location of D.C. junction box on models SW6D and SW6DE. Refer to Figure 5 and 6 for location of D.C. junction box on models SW6DM and SW6DEM.
- C. The electrical connections must be made in accordance with local codes and regulations. In the absence of local codes and regulations, refer to the latest edition of the National Electrical Code ANSI/NFPA No. 70.
- In Canada, the electrical installation should conform with CSA standard CSA C22.2 No. 148/Z240.6.2 Electrical Requirements for Recreational Vehicles and CSA C22.1 Canadian Electrical Code Part 1 when installing the unit in recreational vehicles and mobile homes respectively.
- D. Make the 12 Volt D.C. electrical connections following the wiring diagram illustrated in Figure 8.

If the power supply is to be from a convertor, we recommend that the convertor system be wired in parallel with the battery. This will serve two purposes:

1. Provide a constant voltage supply
2. Filter any A.C. spikes or volt surges

We recommend insulated terminals be used for all electrical connections.

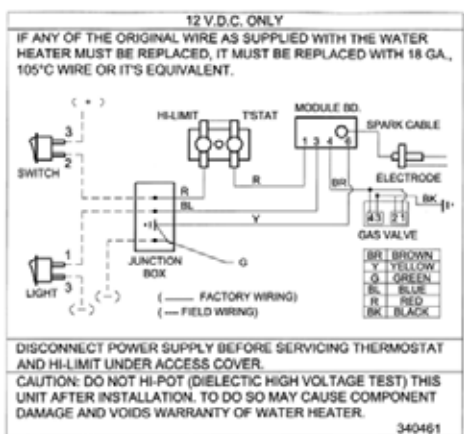


Figure 8

MAKING ELECTRICAL CONNECTIONS 120 VOLTS A.C.

- A. Applicable to following models SW6DE and SW6DEM.
- B. Refer to Figure 2 for location of A.C. junction box on model SW6DE. Refer to Figure 6 for A.C. junction box on model SW6DEM.
- C. The electrical connections must be made in accordance with local codes and regulations. In the absence of local codes and regulations, refer to the latest edition of the National Electrical Code ANSI/NFPA No. 70.
- In Canada, the electrical installation should conform with CSA standard CSA C22.2 No. 148/Z240.6.2. Electrical requirements for Recreational Vehicles and CSA C22.1 Canadian Electrical Code Part 1 when installing the unit in recreational vehicles and mobile homes respectively.
- D. Check rating plate and wiring diagram (Figure 9) before proceeding. Install a fused safety switch or circuit breaker of adequate capacity between heater and electrical power source. Attach the black and white wires from the fused switch or breaker to corresponding colored wires in heater junction box. A green wire from a well grounded source must be attached to the green nut in the junction box.
- CAUTION: Before applying the 120 VAC power to the water heater junction box, be sure the switch for electric element is in the "OFF" position.**

WARNING! Before the switch for the electric element is turned to the "ON" position, the water heater tank must be filled with water. See "Safety Warnings".

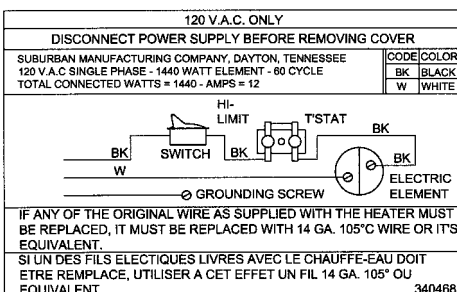


Figure 9

INSTALLATION OF MOTOR AID HEAT EXCHANGER

- A. Place copper "Y"s in heater as shown in Figure 10.
- B. Secure hoses to "Y"s with hose clamps.
- C. Attach hose from motor-aid heat exchanger to "Y"s.
- D. Secure hoses to motor-aid and "Y"s with clamps.
- E. Check all connections for water leaks and proper water circulation through motor-aid heat exchanger, with engine running.
- The system should be checked annually for deterioration of heater hose and hose connections. Replace as needed.

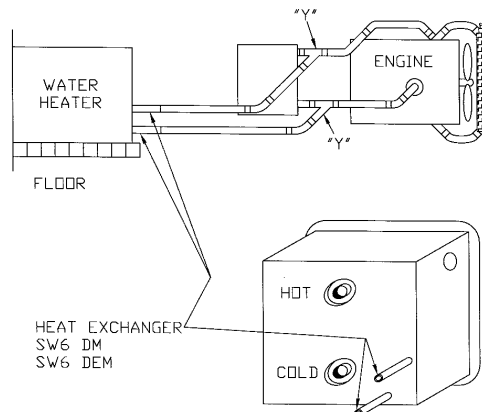


Figure 10

MAINTENANCE

WARNING! If the user of this appliance fails to maintain it in the condition in which it was shipped from the factory or if the appliance is not used solely for its intended purpose or if appliance is not maintained in accordance with the instructions in this manual, then the risk of a fire and/or the production of carbon monoxide exists which can cause personal injury, property damage or loss of life.

WARNING: For your safety, all repairs should be performed by your dealer or a qualified service person.

- A. Main Burner: Do not allow the burner to burn with a yellow flame, because sooting will occur. (See Safety Warnings). If the burner flame is yellow and has an erratic pattern, shut unit down and contact a qualified service agency. Do not continue operating unit with improper burner flame. (See Figure 11 for correct and incorrect burner flame appearance.)
- B. Periodically inspect unit for soot. If soot is present anywhere on water heater, immediately shut unit down and contact your dealer or a qualified service person. Soot is a sign of incomplete combustion and must be corrected before operating water heater. Areas to check would include:
1. Check for an obstruction in burner or the flue box.
 2. Check the screen in the door to see that no foreign material has accumulated to prevent flow of combustion and ventilating air.
 3. Check to be sure there is no flame present at burner orifice or burner whenever main gas valve is closed. This can be checked by turning the OFF/ON switch to the "OFF" position.
- C. Frequent checks should be made of the grommet on the gas inlet to assure tight seal. (See "Making Gas Connections").
- D. Periodically check wiring and wire connection to be sure wiring is not damaged/frayed and that all terminals and connections are tight and in compliance with codes (See "Making Wire Connections").

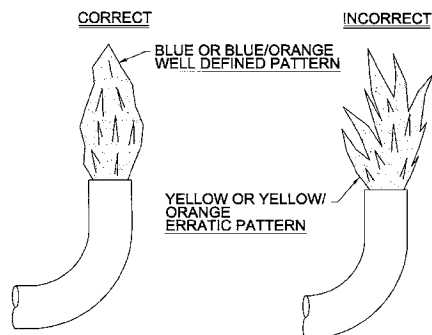


Figure 11



SAFETY WARNINGS

WARNING! It is imperative that the water heater tank be filled with water before operating the water heater. Operation of the water heater without water in the tank may result in damage to the tank and/or controls. This type of damage is not covered by the limited warranty.

WARNING! Hydrogen gas may result if you have not used this heater for two weeks or more. **HYDROGEN GAS IS EXTREMELY FLAMMABLE.** To reduce the risk of injury under these conditions, open the hot water faucet for several minutes at the kitchen sink before you use any electrical appliance connected to the hot water system. If hydrogen is present, you probably will hear an unusual sound such as air escaping through the pipe as the water begins to flow.

Hydrogen gas may be present even after water has been drained from the tank. Open faucet at sink and allow system to vent for several minutes (5-10 minutes).

Do not smoke or have any open flame near the open faucet. Do not attempt to light pilot or main burner. On DSI models, be sure the switch is "OFF".

Should overheating occur, or the gas supply fail to shut off, shut off the manual gas valve to the appliance before shutting off the electrical supply. Do not use this appliance if any part has been submerged under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control that has been submerged under water.

Do not alter the operation of your water heater nor change the design/construction of your water heater. Accessories are being marketed for RV products which we do not recommend. For your safety, only factory authorized parts are to be used on your water heater.

Periodically inspect the vent for obstructions or presence of soot. Soot is formed whenever combustion is incomplete. This is your visual warning that the water heater is operating in an unsafe manner. If soot is present, immediately shut the water heater down and contact your dealer or a qualified service person.

When considering add-on rooms, porch or patio, attention must be given to the venting of your water heater. For your safety, do not terminate the vent on your water heater inside add-on rooms, screen porch or onto patios. Doing so will result in products of combustion being vented into the rooms or occupied areas.

Never operate the heater if you smell gas. Do not assume that the smell of gas in your RV is normal. Any time you detect the odor of gas, it is to be considered life threatening and corrected immediately. Extinguish any open flames including cigarettes and evacuate all persons from the vehicle. Shut off gas supply at LP gas bottle. (See Safety notice on front cover of this manual.)

NOTE: Always open both the cold and hot water faucets when filling vehicle water tank to allow air pockets to be forced out of the water heater. When water flows from the heater faucets, close both faucets.

WARNING! Do not store or use combustible materials or liquids near or adjacent to this heater. The appliance shall not be installed in any location where flammable liquids or vapors are likely to be present.

Be sure the power is "OFF" to the water heater ignition system during any type of refueling and while vehicle is in motion or being towed.

The thermostat on your water heater is not adjustable. It is a temperature sensing limit designed to maintain a water temperature of 130°F (54°C). Water temperatures over 130°F (54°C) can cause severe burns instantly or death from scalds; therefore, be careful when using hot water. Children, disabled and elderly are at highest risk of being scalded. Always feel water before bathing or showering.

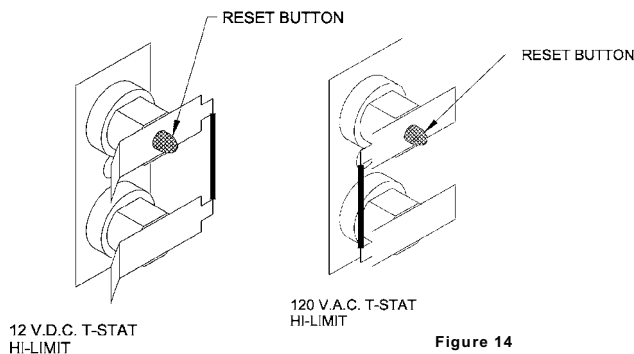


Figure 14

Figure 13

ANODE PROTECTION

The tank in this water heater is protected by a magnesium or aluminum anode to prolong the life of the tank by absorbing the corrosive action of hot water. Under normal use, the anode rod will deteriorate and because of this, we recommend it be replaced yearly. **NOTE:** Water with high levels of iron and/or sulfate will increase the rate of deterioration; therefore, more frequent replacement may be required. If anode rod is mostly eaten away, replace it with a new one. (See Figure 12)

To prevent a water leak when replacing the anode rod, a pipe thread sealant approved for potable water (such as Teflon tape) must be applied to the threads of the anode rod. Proper application of a thread sealant will not interfere with the anode's tank protection.

Operating the water heater without proper anode protection will decrease tank life and will void your warranty on the tank. **NOTE:** Tank is drained by removing anode rod (See "Drain and Storage" instructions).

To extend anode life, drain water from tank whenever RV is not being used. Avoid any extended time of non use with water in tank.

Also, refer to section on winterizing.

WARNING! Do not replace the anode rod with any non-Suburban accessory part, such as an "add-on" electric heating element. Items such as these are not approved to be installed in Suburban products. They could create an unsafe condition and will also void all warranties.

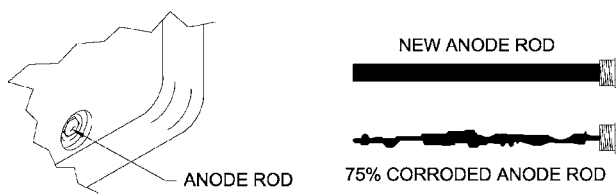


Figure 12

PRESSURE RELIEF VALVE

The temperature and pressure relief valve is designed to open if the temperature of the water within the heater reaches 210°F, or if the water pressure in the heater reaches 150 pounds. Recreational vehicle water systems are closed systems and during the water heating cycle the pressure build-up in the water system will reach 150 pounds. When this pressure is reached, the pressure relief valve will open and water will drip from the valve. This dripping will continue until the pressure is reduced to below 150 pounds, and the valve closes. This condition is normal and does not indicate a defective relief valve.

WARNING! Do not place a valve between the relief valve and the tank. Do not plug the relief valve under any circumstances.

WATER WEEPING OR DRIPPING FROM PRESSURE RELIEF VALVE

You may experience water weeping or dripping from your water heater's Pressure and Temperature (P & T) Relief Valve when your water heater is operating. Water weeping or dripping from the P & T Valve does not always mean the P & T Valve is defective. As water is heated, it expands. The water system in a recreational vehicle is a closed system and does not allow for the expansion of heated water. When the pressure of the water system exceeds the relieving point of the P & T Valve, the valve will relieve the excess pressure.

Suburban recommends that a check valve not be installed directly at the inlet to the water heater tank. This will increase weeping of the pressure relief valve.

WARNING! Do not remove or plug the relief valve.

One way to reduce the frequency of this occurrence is to maintain an air pocket at the top of the water heater tank. This air pocket will form in the tank by design. However, it will be reduced over time by the everyday use of your water heater.

To replenish this air pocket:

1. Turn off water heater.
2. Turn off cold water supply line.
3. Open a faucet in the RV.
4. Pull out on the handle of the Pressure Relief (P & T) Valve and allow water to flow from the valve until it stops.
5. Release handle on P & T Valve - it should snap closed.
6. Close faucet and turn on cold water supply; as the tank fills, the air pocket will develop.

Repeat this procedure as often as needed to reduce the frequency of the weeping of the P & T Valve. If the weeping persists after following this procedure, you may elect to install an expansion or accumulator tank in the cold water line between the tank and check valve to relieve the pressure caused by thermal expansion. Contact your local dealer for assistance.

THERMOSTAT AND MANUAL RESET

MODELS: SW6D, SW6DE, SW6DM and SW6DEM (See Figure 13)

The model water heaters listed above are equipped with a high temperature limit as a cut-off device. Temperature above 180°F will cause manual reset button to trip shutting down main burner.

To activate burner, the water temperature must be below 110°F, push reset button to re-activate burner.



THERMOSTAT AND MANUAL RESET

MODELS SW6DE and SW6DEM (See Figure 14)

The model water heaters listed above are equipped with a high temperature limit as a cut-off device. Temperature above 180°F will cause manual reset button to trip shutting down the electric element.

To activate element, the water temperature must be below 110°F, push reset button to re-activate the electric element.

DRAINING AND STORAGE INSTRUCTIONS

If RV is to be stored during winter months, the water heater must be drained to prevent damage from freezing.

1. Turn off electrical power to water heater either at the switch from the electrical element or at breaker.
2. Shut off gas supply to water heater.
3. Turn off pressure pump on water system.
4. Open both hot and cold water faucets.
5. Remove anode rod from tank.
6. Follow RV manufacturer's instructions for draining entire water system.

NOTE: Be certain to refill water heater with water and remove all air from tank and lines before re-lighting or before turning on electrical power.

ODOR FROM HOT WATER SYSTEM

Odor from the hot water system is not a service problem and many water supplies contain sufficient amounts of sulphur to produce an odor. The odor is similar to rotten eggs and is often referred to as "sulphur water". It is not harmful - only unpleasant to smell. Sulphur water can be caused by a chemical action or by bacteria. The solution to eliminate is chlorination of the water system. Add about six (6) ounces of chlorinated common household liquid bleach to each 10 gallons in the water tank. Then run the chlorinated water throughout the system,

opening each faucet one at a time until you smell the chlorine. Let the RV sit for a few days and the chlorine should take care of the problem. Then you will need to take care of the chlorine. Remove the chlorine by flushing the system with fresh water. This may take several attempts. You may consider adding a filtering system that removes chlorine and prevents sulphur water. If the sulphur or rotten egg smell continues, flush the system once again as described above and replace anode rod as necessary.

REMOVING WATER HEATER

1. Shut off gas supply and disconnect gas supply line from water heater.
2. On all Electric Models, disconnect 120 V.A.C. supply at junction box mounted on heater.
3. On all DSI Models, disconnect 12 V.D.C. power supply at junction box on heater.
4. On Models SW6D and SW6DE disconnect all wires at module board.
5. Shut off water supply. Drain water from tank following instructions under "Draining and Storage".
6. Disconnect hot and cold water lines from water heater.
7. Remove screws or nails securing control housing to framed opening.
8. Slide heater out. To reinstall, follow instructions in manual under "Installation Instructions".

WINTERIZING

If your water heater plumbing system is equipped with a bypass kit, use it to close off the water heater, drain the water heater completely and leave the water heater closed off (out of the system) in the bypass position particularly if you are introducing antifreeze into the plumbing system. Antifreeze can be very corrosive to the anode rod creating premature failure and heavy sediment in the tank. If the plumbing system is not equipped with a bypass kit, and you intend to winterize by adding antifreeze to the system, remove the anode rod (storing it for the winter) and replace it with a 3/4" drain plug.

FOR YOUR SAFETY READ BEFORE OPERATING

WARNING! If the user of this appliance fails to maintain it in the condition in which it was shipped from the factory or if the appliance is not used solely for its intended purpose or if appliance is not maintained in accordance with the instructions in this manual, then the risk of a fire and/or the production of carbon monoxide exists which can cause personal injury, property damage or loss of life.

OPERATING INSTRUCTIONS

WARNING! If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

WARNING: Before operating water heater, be sure tank is filled with water. See "Safety Warnings".

- A. This appliance does not have a pilot. It is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.
- B. BEFORE LIGHTING smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
 - Do not touch any electric switch.
 - Do not use any phone in your building.
 - Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
 - If you cannot reach your gas supplier, call the fire department.
- C. This is an automatic gas valve, no adjustments are necessary. Do not attempt to repair the gas valve. This may result in a fire or explosion.
 - D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.
 - E. Before operating water heater, check the location of the vent to make sure it will not be blocked by the opening of any door on the trailer. If it can be blocked, do not operate the water heater with the door open.

OPERATING INSTRUCTIONS

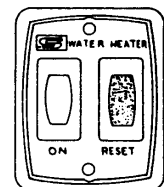
1. STOP! Read the safety information provided.
2. Turn off all electric power to the appliance.
3. Turn "OFF" gas supply.
4. Wait five minutes for gas to clear the area. If you smell gas then STOP! Follow instructions in item B of the safety information. If you don't smell gas, go to next step.
5. Turn "ON" gas supply.
6. Turn on electrical power to the appliance.
7. Turn switch to "ON" position. If the burner does not light, the system will automatically attempt two more tries for ignition before lock-out.

NOTE: Each ignition cycle will have a 15 second purge before spark cycle if system is a three try system.

8. If lockout occurs before main burner lights, turn switch to "OFF", wait five seconds and turn switch to "ON" position. This will restart the ignition cycle. The first start-up of the heater may require several ignition cycles before all air is purged from the gas lines.

If the burner will not come on, the following items should be checked before calling a service person.

1. Switch turned off.
2. Gas supply to heater is empty or turned off.
3. Reset button on ECO is tripped.



OPERATING INSTRUCTIONS FOR UNITS WITH ELECTRIC ELEMENT

Electric water heaters are designed to operate with a minimum amount of service problems; however, proper operation and care is essential.

By far the most common trouble with electric water heaters results from energizing the water heater before it is filled with water. Even brief operation of the electric element without water in the tank will burn-out the electric heating element.

To energize the electric heating element, turn the switch to "ON". The switch is located behind the water heater door in the lower left corner of the control housing. The water temperature will be regulated by the thermostat.

TO TURN OFF WATER HEATER

1. Turn switch to "OFF" position.
2. Turn off electrical power to the appliance.
3. Turn off gas supply.
4. If vehicle is to be stored or heater is going to be turned off while subject to freezing temperature, drain water heater. (See "Draining and Storage Instructions.")



PARTS ILLUSTRATION AND REPLACEMENT PARTS LIST

Only factory authorized parts are to be used. Do not attempt to repair defective parts.

When ordering repair parts from your dealer or a distributor, always give the following information:

1. Part Number (Not Item No.)
2. Part Description
3. Model No. and Serial No. of your Heater
4. Number of Parts Required

PARTS LIST FOR MODELS SW6D • SW6DE (Figure 15)

Item No.	Description	Part Number	
		SW6D	SW6DE
1	Module Board	520814	520814
3	Cover, Module Board	090487	090487
6	Bushing, Snap 1/2"	070270	070270
7	Bushing, Strain Relief 5/8"	230216	230216
8	D.C. Junction Box Assembly	090517	090517
10	Back Assembly, Flue Collector	101682	101682
11	Front, Flue Collector	101776	101776
12	Valve, Pressure Relief	161157	161157
13	Screw #10 x 1/4	121577	121577
15	Cover, Thermostat/Hi-Limit	090562	090562
16	Gasket, Thermostat Cover	070987	070987
18	Grommet	070874	070874
20	Bracket, Electrode Mounting	063187	063187
21	Electrode	232258	232258
24	Cover, Element	-----	090445
25	Gasket, Element Cover	-----	070988
26	Burner Assembly with orifice	010843	010843
28	Electric Element with Gasket	-----	520789
29	Anode	232767	232767
31	Grommet	071246	071246
32	Bushing, Snap 1/2"	-----	070270
33	Switch, Electric Element	-----	232362
34	Gas Fitting	170374	170374
35	Bracket, Valve Mounting	063243	063243
36	Valve, Gas (LP)	161109	161109
37	Manifold, Outlet	171420	171420
38	#10 x 1/4 (4 Required)	121577	121577
39	Screw #8-32 x 3/8 Hex HD. (2 Required)	121958	121958
41	Switch Assembly, 12 V.D.C. T-Stat/Hi-Limit	232282	232282
42	Switch Assembly, 120 V.A.C. T-Stat/Hi Limit	-----	232306
44	Cover, Junction Box	-----	090576
45	Grommet, Gas Inlet	070989	070989
46	Bushing, Snap 7/8"	-----	230218
47	A.C. Junction Box Assembly	-----	090575
48	Nut, 10-24 Keps (Green)	121576	121576
49	Bushing, Snap 7/8"	-----	230218
50	Foam Jacket Assembly Complete	520868	520868
51	Switch, Lamp and Plate Assembly	232589	232589
52	Screw 8mm - 4.0 x 1/2 Hex Washer Head (2 Required)	121943	121943
53	Burner Bracket	063444	063444
55	1/4 Loxit Nut (Manifold to Burner)	171463	171463
56	1/4 Loxit Nut (Manifold to Valve)	171463	171463
57	Electrode Wire (Not Shown)	232456	232456

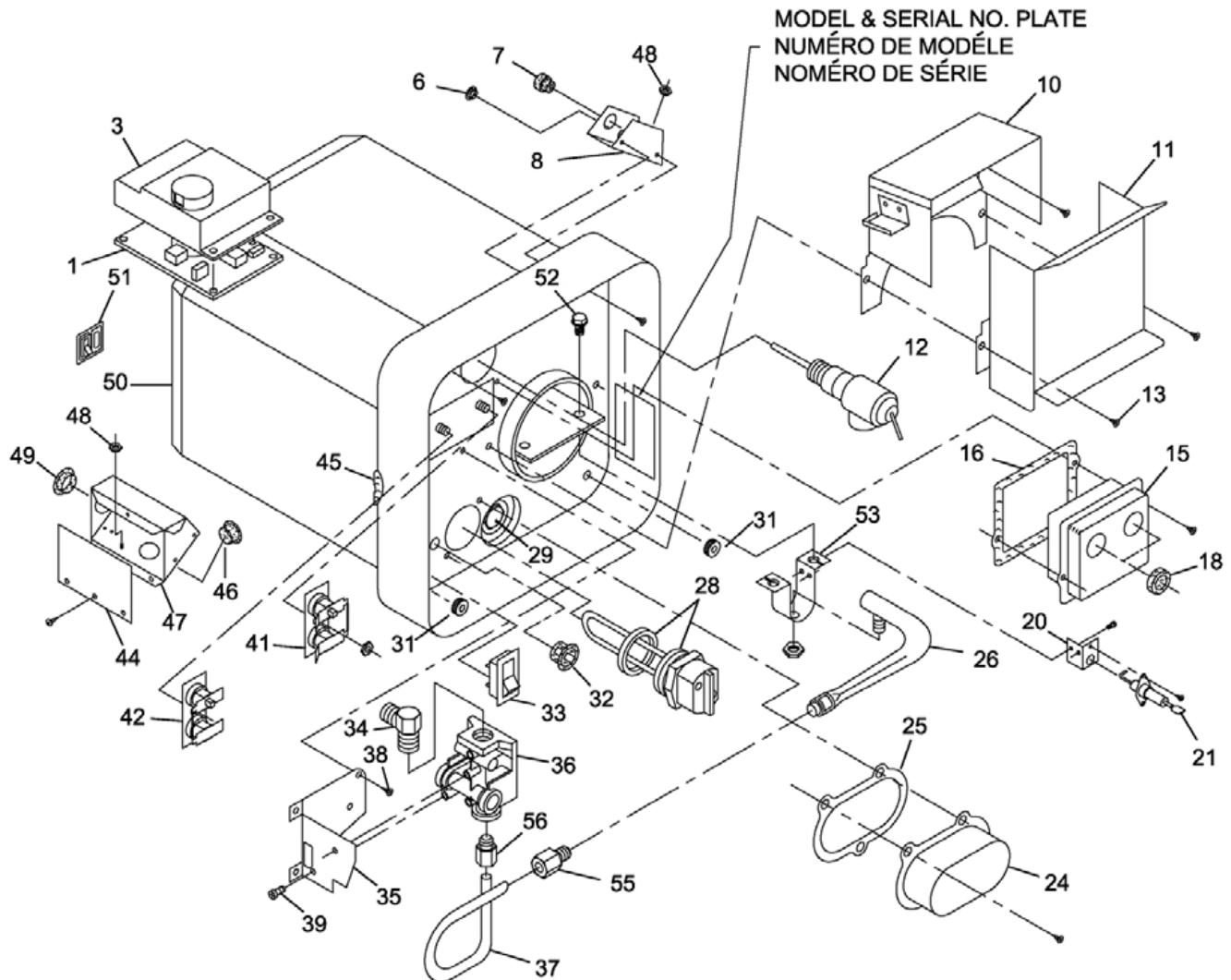


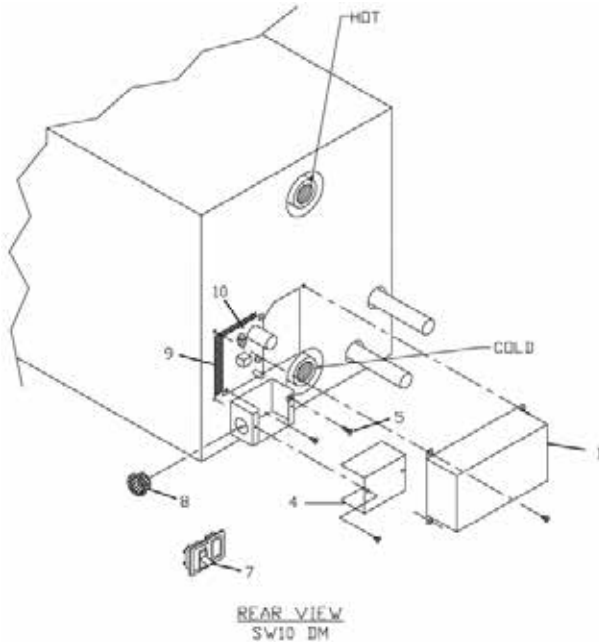
Figure 15



PARTS LIST FOR MODEL SW6DM (Figures 16 and 17)

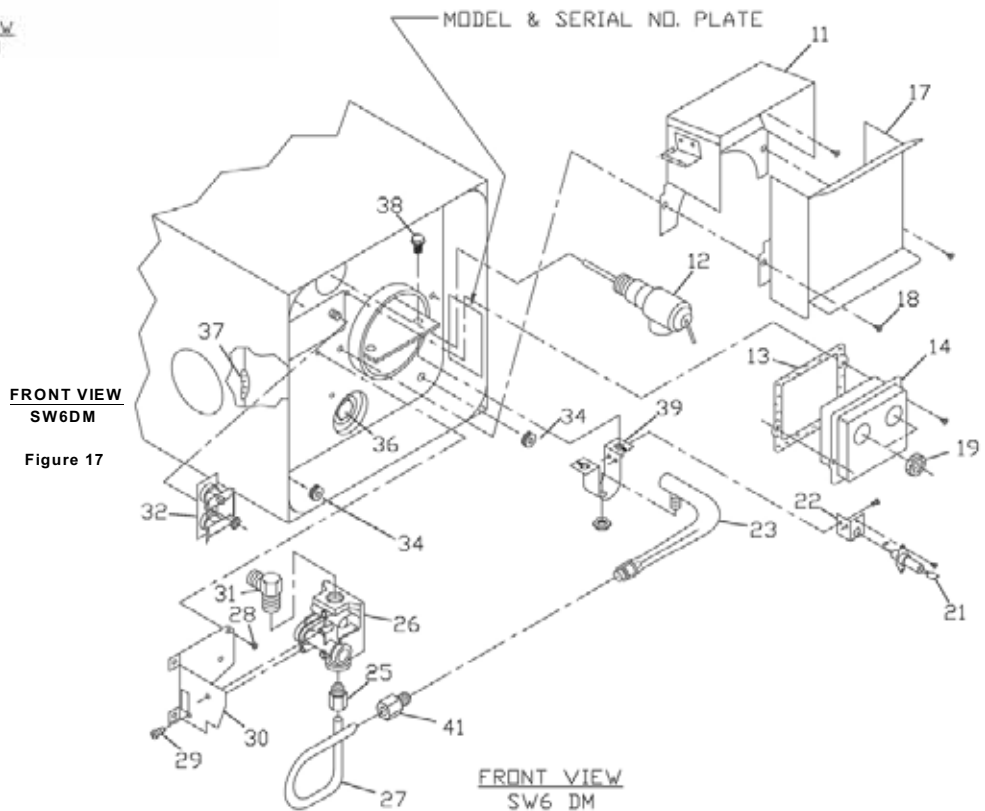
Item No.	Description	Part Number SW6DM
1	Cover, Module Board	090340
4	Cover Junction Box	090344
5	Screw 10-32 x 3/8 (Green)	121702
7	Switch, Lamp and Plate Assembly	232589
8	Bushing, Snap 7/8"	230218
9	Insulator, Module Board	070807
10	Module Board	520814
11	Back Assembly, Flue Collector	101682
12	Valve, Pressure Relief	161157
13	Gasket, Thermostat Cover	070987
14	Cover, Thermostat/Hi-Limit	090562
17	Front, Flue Collector	101776
18	Screw 10 x 1/4	121577
19	Grommet	070874

Item No.	Description	Part Number SW6DM
21	Electrode	232258
22	Bracket, Electrode Mounting	063187
23	Burner Assembly with orifice	010843
25	1/4 Loxit Nut (Manifold to Valve)	171463
26	Valve, Gas (LP)	161109
27	Manifold Outlet	171420
28	Screw 10 x 1/4 (4 Required)	121577
29	Screw 8-32 x 3/8 Hex HD (2 Required)	121958
30	Bracket, Valve Mounting	063243
31	Gas Fitting	170374
32	Switch Assembly 12 V.D.C. T-Stat/Hi-Limit	232282
34	Grommet	071246
36	Anode	232767
37	Grommet, Gas Inlet	070989
38	Screw 8mm - 4.0 x 1/2 Hex Washer Head (2 Required)	121943
39	Burner Bracket	063444
41	1/4 Loxit Nut (Manifold to Burner)	171463
42	Electrode Wire (Not Shown)	232454



REAR VIEW
SW6DM

Figure 16



FRONT VIEW
SW6DM

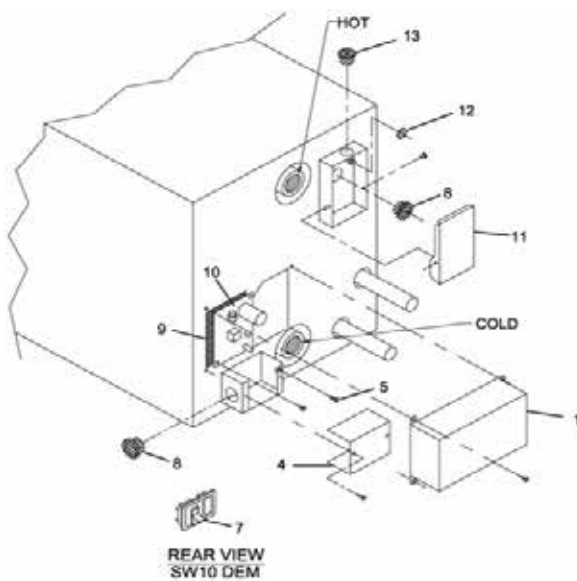
Figure 17



PARTS LIST FOR MODEL SW6DEM (Figures 18 and 19)

Item No.	Description	Part Number SW6DEM
1	Cover, Module Board	090340
4	Cover, Junction Box (12 V.D.C.)	090344
5	Screw 10-32 x 3/8 (Green)	121702
7	Switch, Lamp and Plate Assembly	232589
8	Bushing, Snap	230218
9	Insulator, Module Board	070807
10	Module Board	520814
11	Cover, Junction Box	090464
12	Nut 10-24 Keps (Green)	121576
13	Bushing	070486
14	Back, Flue Collector	101682
16	Screw #10 x 1/4	121577
17	Front, Flue Collector	101776
18	Valve, Pressure Relief	161157
19	Gasket, Thermostat Cover	070987
20	Cover, Thermostat/Hi-Limit	090562
23	Grommet (2 Required)	070874
25	Electrode	232258
26	Bracket, Electrode Mounting	063187

Item No.	Description	Part Number SW6DEM
28	Cover, Element	090445
29	Gasket, Element Cover	070988
30	Burner Assembly with orifice	010843
32	1/4 Loxit Nut (Manifold to Valve)	171463
33	Electric Element with Gasket	520789
34	Anode	232767
36	Grommet	071246
37	Switch, Electric Element	232362
38	Valve, Gas (LP)	161109
39	Manifold, Outlet	171420
40	Screw 10 x 1/4 (4 Required)	121577
41	Screw #8-32 x 3/8 Hex HD	121958
43	Bracket, Valve Mounting	063243
44	Gas Fitting	170374
45	Bushing, Snap 1/2"	070270
47	Switch Assembly, 120 V.A.C. T-Stat/Hi-Limit	232306
48	Switch Assembly, 12 V.D.C. T-Stat/Hi-Limit	232282
49	Grommet, Gas Inlet	070989
50	Screw 8mm - 4.0 x 1/2 Hex Washer Head (2 Required)	121943
52	Burner Bracket	063444
53	1/4 Loxit Nut (Manifold to Burner)	171463
	Electrode Wire (Not Shown)	232454

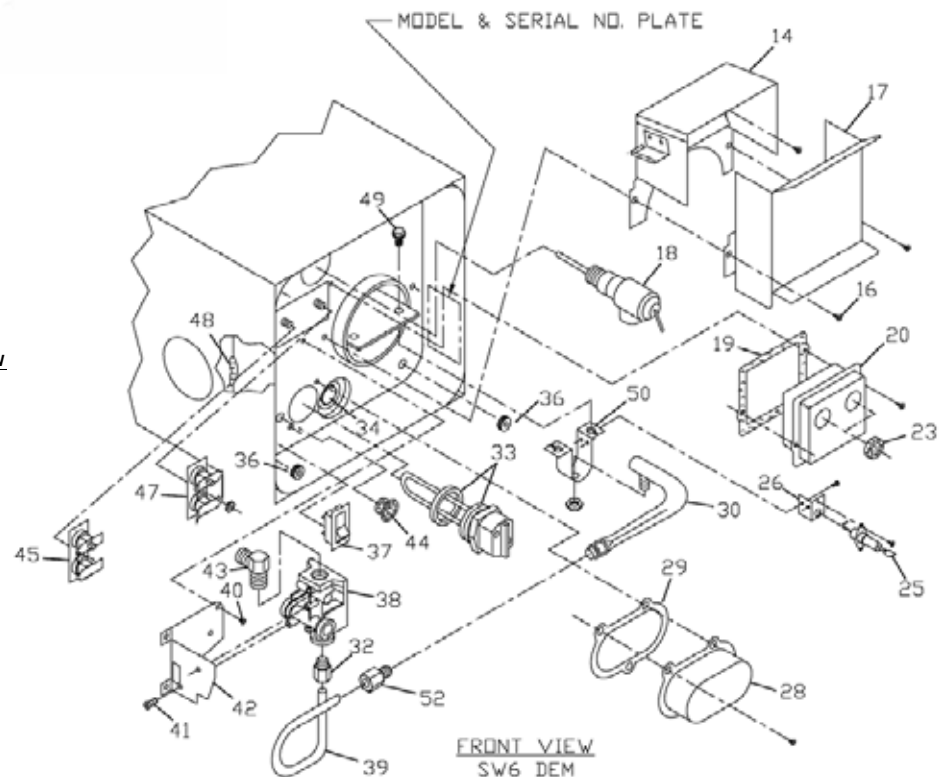


REAR VIEW
SW6DEM

Figure 18

FRONT VIEW
SW6DEM

Figure 19



FRONT VIEW
SW6 DEM



TWO YEAR LIMITED WARRANTY SUBURBAN RECREATIONAL VEHICLE WATER HEATER

TWO YEAR LIMITED WARRANTY

This Suburban product is warranted to the original purchaser to be free from defects in material and workmanship under normal use and maintenance for a period of two years from date of purchase whether or not actual use begins on that date. It is the responsibility of the consumer/owner to establish the warranty period. Suburban does not use warranty registration cards for its standard warranty. You are required to furnish proof of purchase date through a Bill of Sale or other payment records.

Suburban will replace any parts that are found defective within the first two years and will pay a warranty service allowance directly to the recommended Suburban Service Center at rates mutually agreed upon between Suburban and its recommended service centers. Replacement parts will be shipped FOB the shipping point within the Continental United States, Alaska and Canada to the recommended service center performing such repairs. All freight, shipping and delivery costs shall be the responsibility of the owner. The exchanged part or unit will be warranted for only the unexpired portion of the original warranty. Before having warranty repairs made, confirm that the service agency is a recommended service center for Suburban. **DO NOT PAY THE SERVICE AGENCY FOR WARRANTY REPAIRS; SUCH PAYMENTS WILL NOT BE REIMBURSED.**

Suburban reserves the right to examine the alleged defect in the water heater or component parts, and it is the owner's obligation to return the water heater and/or component parts to Suburban or its representative. When returning a water heater, it must include all component parts and the serial number plate. Returned component parts must be individually tagged and identified with the water heater's model number, serial number and date of installation.

For warranty service, the owner/user should contact the nearest recommended Suburban Service Center, advising them of the model and serial numbers (located on the water heater) and the nature of the defect. Transportation of the RV to and from the Service Center and/or travel expenses of the Service Center to your location is the responsibility of the owner/user. A current listing of recommended service center may be obtained from Suburban's website: www.rvcomfot.com. If you cannot locate a recommended service center locally, the service agency chosen to perform warranty repairs must contact our Service Department at 423-775-2131 for authorization before making repairs. Unauthorized repairs made will not be paid by Suburban.

THREE YEAR LIMITED WARRANTY ON TANK

The inner tank is further warranted to be free from defects in material and workmanship during the third year after the date of original purchase. A replacement water heater will be provided under the same conditions as stated in the two year warranty EXCEPT no labor reimbursement will be provided.

LIMITATION OF WARRANTIES

ALL IMPLIED WARRANTIES (INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY) ARE HEREBY LIMITED IN DURATION TO THE PERIOD FOR WHICH EACH LIMITED WARRANTY IS GIVEN. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU. THE EXPRESSED WARRANTIES MADE IN THIS WARRANTY ARE EXCLUSIVE AND MAY NOT BE ALTERED, ENLARGED, OR CHANGED BY ANY DISTRIBUTOR, DEALER OR OTHER PERSON WHOMSOEVER.

SUBURBAN WILL NOT BE RESPONSIBLE FOR:

1. Normal maintenance as outlined in the installation, operating and service instructions owner's manual including cleaning of component parts and cleaning or replacement of the burner orifice. Any water damage arising, directly or indirectly, from any defect in the water heater or component parts or from its use.
 2. Initial checkouts and subsequent checkouts which indicate the water heater is operating properly, or diagnosis without repair.
 3. Damage or repairs required as a consequence of faulty or incorrect installation or application not in conformance with Suburban instructions.
 4. Failure to start and/or operate due to loose or disconnected wires; water or dirt in controls, fuel lines and gas tanks; improper gas pressure; low voltage.
 5. Cleaning or adjustment of components; electrode, burner tube, pilot and thermocouple.
 6. Costs incurred in gaining access to the water heater.
 7. Parts or accessories not supplied by Suburban.
 8. Freight charges incurred from parts replacements.
 9. Damage or repairs needed as a consequence of any misapplication, abuse, unreasonable use, unauthorized alteration, improper service, improper operation or failure to provide reasonable and necessary maintenance.
 10. Suburban products whose serial number has been altered, defaced or removed.
 11. Suburban products installed or warranty claims originating outside the Continental U.S.A., Alaska, Hawaii and Canada.
 12. Damage as a result of floods, winds, lightning, accidents, corrosive atmosphere or other conditions beyond the control of Suburban.
 13. ANY SPECIAL, INDIRECT OR CONSEQUENTIAL PROPERTY, ECONOMIC OR COMMERCIAL DAMAGE OF ANY NATURE WHATSOEVER. Some states do not allow the exclusion of incidental or consequential damages, so the above limitation may not apply to you.
- NO REPRESENTATIVE, DEALER, RECOMMENDED SERVICE CENTERS OR OTHER PERSON IS AUTHORIZED TO ASSUME FOR SUBURBAN MANUFACTURING COMPANY ANY ADDITIONAL, DIFFERENT OR OTHER LIABILITY IN CONNECTION WITH THE SALE OF THIS SUBURBAN PRODUCT.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

IF YOU HAVE A PRODUCT PROBLEM

FIRST:

If your RV has its original water heater and is still under the RV manufacturer's warranty, follow the steps suggested by your dealer or manufacturer of the RV.

SECOND:

Contact a conveniently located recommended Suburban Service Center. Describe to them the nature of your problem, make an appointment, if necessary, and provide for delivery of your RV to the selected service center.

THIRD:

For the location of the nearest Service Center, refer to the listing provided or contact:

Suburban Manufacturing Company
Customer Service Department
676 Broadway Street
Dayton, Tennessee 37321
(423) 775-2131, Ext. 7101
www.rvcomfort.com

For future reference, you should record the following information

MODEL NUMBER _____

SERIAL NUMBER _____

STOCK NUMBER _____

DATE OF PURCHASE _____

Truma CP plus VarioHeat



Operating instructions

To be kept in the vehicle.
This document is part of the product.



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California Proposition 65 lists chemical substances known to the state to cause cancer, birth defects, death, serious illness or other reproductive harm. This product may contain such substances.



Trademark information

Truma CP plus VarioHeat control panel referred to as CP plus VarioHeat below.

Truma AquaGo referred to as AquaGo below.

Truma VarioHeat comfort referred to as VarioHeat below.

Aventa eco and Aventa comfort referred to as Aventa below.

VarioHeat is a furnace. For technical reasons they it referred to as "HEATING" in the display text.

⚠ WARNING

FIRE OR EXPLOSION HAZARD

Failure to follow safety warnings exactly could result in serious injury, death or property damage.

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

WHAT TO DO IF YOU SMELL GAS

- Evacuate all persons from the vehicle.
- Shut off the gas supply at the gas container or source.
- Do not touch any electrical switch or use any phone or radio in the vehicle.
- Do not start the vehicle's engine or electric generator.
- Contact the nearest gas supplier or certified service technician for repairs.
- If you cannot reach a gas supplier or certified service technician, contact the nearest fire department.
- Do not turn on the gas supply until gas leaks have been repaired.

Installation and service must be performed by a certified service technician, service agency, or the gas supplier.



Consumer Safety Information

Safety Definitions

⚠ This is the safety alert symbol. This symbol alerts you to potential hazards that can kill or hurt you and others.

⚠ WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

NOTICE is used to address practices not related to physical injury.



Other important information or tips.

Safety Behavior and Practices

⚠ WARNING

- Use the CP plus VarioHeat only when it is in a technically sound condition.
- Have a specialist immediately remedy any malfunctions. Remedy the malfunction yourself only if a remedy is specified in the troubleshooting chart in these operating instructions.
- Have a defective CP plus VarioHeat repaired only by the manufacturer or its service department.
- Any alteration to the appliance or its controls can be dangerous and will void the warranty.
- Switch OFF the VarioHeat furnace and/or AquaGo when refueling, pumping gas or when the recreational vehicle (RV) is in a parking garage, on a ferry, or in enclosed spaces (such as a garage, repair shop). Make absolutely sure that the VarioHeat furnace and/or AquaGo cannot be switched on via the time switch. To do this, you have to switch the CP plus VarioHeat off or interrupt the power supply to the control panel.

Intended use

The CP plus VarioHeat is suitable only for installation in RVs used for recreation, travel, or camping.

The CP plus VarioHeat controls and monitors the following appliances:

- VarioHeat
- AquaGo
- Aventa eco / comfort

Important notes

- If the power supply to the system has been interrupted, the time / time switch must be reset.
- If a new or replacement appliance (furnace, air conditioning system or hot water system) is connected to the bus system, the procedure described in "Initial start-up" must be repeated.



Operating Instructions

Display and Operating Elements

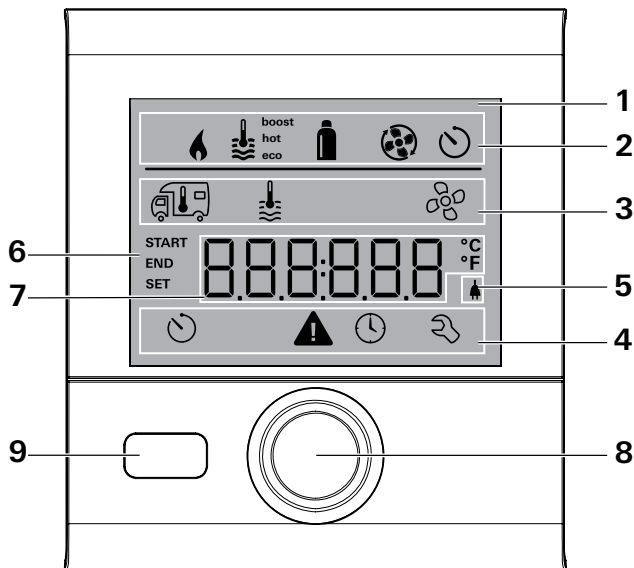


Fig. 1

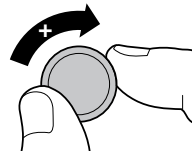
- 1 Display
- 2 Status line
- 3 Menu line (top)
- 4 Menu line (bottom)
- 5 Power supply display
120 V AC (mains supply)
- 6 Time switch display
- 7 Settings/Values (displayed text)
- 8 Rotary push button
- 9 Back button

Description

- A rotary push button (8) is used to select menu items in the menu lines (3 + 4) and to adjust settings.
- Information is shown on a backlit display (1).
- The back button (9) is used to go back to a previous menu.

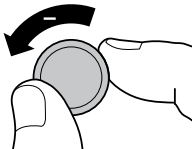
Rotary push button

The rotary push button (8) is used to select and change setpoints and parameters; it is then tapped to save the values. Selected menu items flash.



Turn clockwise

- The menu is scrolled through from left to right
- Increase values (+)



Turn counterclockwise

- The menu is scrolled through from right to left
- Reduce values (-)



Tap

- Save a selected value
- Select a menu item, go to the setting level

Press and hold

- Main switching function – control panel on/off.

Back button

Press the back button (9) to go back to a previous menu and cancel settings. This means that the previous values remain unchanged.

Initial start-up

Perform the following steps for initial start-up:

1. Switch on the power supply.
 - 12 V DC for the CP plus VarioHeat and furnace, air conditioning system or hot water system
2. Start searching for the appliances in the menu item "Service menu" → "RESET" → "PR SET".

When you have confirmed the selection, the CP plus VarioHeat is initialized. "INIT .." appears on the display while this is in progress. This stores the devices that have been found in the control panel.



Start-up

Start / Stand-by screen

When the CP plus VarioHeat is connected to the power supply, a start screen is displayed after a few seconds.

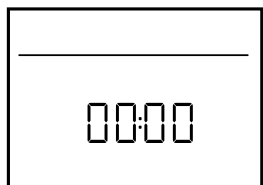


Fig. 2



- The display alternates between the current time and the room temperature that you set.
- Special displays on command via CI-BUS (refer to "Special displays" on page 11).
- After repairs or upgrades, "initial start-up" has to be repeated.

Functions

The functions of menu lines (Fig. 1 – 3, 4) of the CP plus VarioHeat can be selected in any sequence. The operating parameters are shown in the status line (Fig. 1 – 2) or in the display (Fig. 1 – 6).

Select setting level

- Tap the rotary push button.

The display shows the setting level. The first icon flashes.

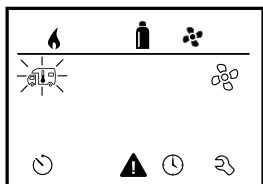


Fig. 3

Switch on / off

Switch on

- Tap the rotary push button.



Previously set values and operating parameters are active again when the panel is switched on.

Switch off

- Press the rotary push button for more than 4 seconds.



The switch off process of the CP plus VarioHeat may take a few minutes due to internal time lags of the furnace, air conditioning system or hot water system ("OFF" is displayed during this time).



Change the room temperature

- Use the rotary push button (Fig. 1 - 8) to select the icon in the menu line (Fig. 4 – 3).
- Tap the rotary push button to go to the setting level.
- Use the rotary push button to select the furnace ("HEATER") or air conditioning system ("AC").
- Tap the rotary push button to confirm the selection.
- Use the rotary push button to select between "OFF", "VENT", "COOL", "AUTO".
- Push rotary push button to confirm the selection.
- Select the desired temperature with the rotary push button.
- Tap the rotary push button to confirm the value.

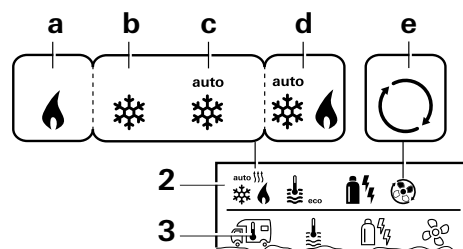


Fig. 4

Furnace ("HEATER")

Adjustable temperature range 40 – 86 °F (1 °F increments) or 5 – 30 °C (1 °C increments)

- a = Furnace on – icon is lit; the icon flashes until the room temperature is reached.



Air conditioning system ("AC")

Adjustable temperature range 60 - 88 °F (1 °F increments) or 16 - 31 °C (1 °C increments)

i Air conditioning system can also be operated with IR remote, see page 12.

Icon	Displayed text	Description
b	COOL	Air conditioning system is switched on
c	AUTO ¹	Air conditioning system is set to automatic
d	NIGHT	Air conditioning system is set to silent mode
d	VENT	Air conditioning system is in air circulation mode

¹ Symbol flashes until the desired room temperature is reached.

i Quick temperature change possible using rotary push button (in stand-by screen).

Automatic climate control ("AUTO")

Adjustable temperature range 64 - 77 °F (1 °F increments) or 18 - 25 °C (1 °C increments)

Automatic changeover between furnace and air conditioning system for an approximately constant temperature inside the vehicle.

e = AUTO – Automatic climate control is activated

Requirements for operation with automatic climate control:

- The furnace and air conditioning system must be connected.
- Automatic climate control (ACC) must be activated in the service menu (see "Service menu" page 9).



Select the fan level

With a furnace / AC connected

1. Use the rotary push button to select the icon in the menu line (Fig. 5 – 3).
2. Tap the rotary push button to go to the setting level.
3. Select the desired fan level with the rotary push button.
4. Tap the rotary push button to confirm the value.

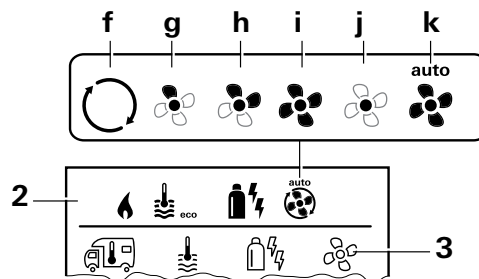


Fig. 5

i The temperature range below 41 °F (5 °C; "OFF") must be selected in order to switch off the furnace.

Furnace ("HEATER")

Icon	Displayed text	Description
–	OFF	Fan is switched off. (only selectable if no appliance is in operation).
g	ECO	Low fan level
h	HIGH	High fan level
i	BOOST	Rapid room heating Available if the difference between the selected and actual room temperature is >10 °C (depends on connected heating appliance)

i When the furnace is switched on (room temperature set), the fan level selected in the previous heating process is shown in the status line (Fig. 1 – 2). The default setting is "AUTO".



Air conditioning system ("AC")

i Air conditioning system can also be operated with IR remote, see page 12.

Icon	Displayed text	Description
–	OFF	Fan is switched off (can be selected only if no appliance is in operation).
g	LOW	Low fan level
h	MID	Medium fan level
i	HIGH	Highest fan level
j	NIGHT	Ultra-quiet fan operation for both the indoor and outdoor fans (only available in cooling mode)



Change hot water mode

1. Use the rotary push button to select the icon in the menu line (Fig. 6 – 3).
2. Tap the rotary push button to go to the setting level.

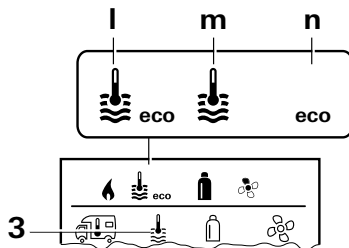


Fig. 6

i If the warning "CLEAN" is displayed, the AquaGo must be decalcified (see "2.2 CLEAN" page 10).

3. Select the desired hot water mode with the rotary push button.
4. Tap the rotary push button to confirm the selection.
5. Select the desired hot water temperature with the rotary push button 95 - 120 °F (35 - 49 °C).
6. Tap the rotary push button to confirm the value.

Hot water mode

Icon	Displayed text	Description
–	OFF	AquaGo is switched off.
l	ECO	The AquaGo is now running in energy-saving mode.
m	COMFOR	The AquaGo is now running in a mode that provides rapid availability of hot water.
n	ANTIFR	Prevention of freezing using 12 V DC electricity:

i Operating mode with installed electric anti-freeze kit (available as an accessory) and appliance switched on. The temperature in the appliance is automatically kept above 41 °F (5 °C).

During operation, the icon is flashing.



Set the time switch

⚠ DANGER

Risk of carbon monoxide poisoning.

The enabled time switch switches the furnace on, even when the recreational vehicle (RV) is parked. The exhaust gas from the furnace can cause poisoning in enclosed spaces (e.g. garages, repair shops).

If you park the RV in an enclosed space:

1. Block the fuel supply (gas) to the furnace.
2. Disable the time switch of the CP plus VarioHeat (OFF).
3. Switch off the furnace on the CP plus VarioHeat .

i If the time switch is "ON", the "Disable time switch ("OFF")" menu is displayed.

1. Use the rotary push button to select the icon in the menu line (Fig. 1 – 4).
2. Tap the rotary push button to go to the setting level.



Enter start time

Use the rotary push button to set the hours and then the minutes.

24 h mode

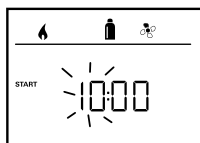


Fig. 7

12 h mode

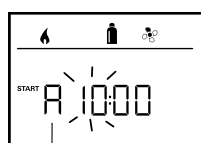


Fig. 8

R = a. m.
P = p. m.

Enter end time

Use the rotary push button to set the hours and then the minutes.

24 h mode



Fig. 9

12 h mode

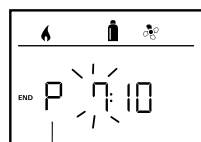


Fig. 10

R = a. m.
P = p. m.

i If the start/end time is earlier than the time when you entered the settings, the operating parameters are not active until the next start/end time is reached. Until then, the operating parameters set outside the time switch remain valid.

Set room temperature

1. Depending on the connected appliance, use the rotary push button to choose between furnace or AquaGo.
2. Tap the rotary push button to confirm the selection.
3. Select the desired room temperature with the rotary push button.
4. Tap the rotary push button to confirm the value.

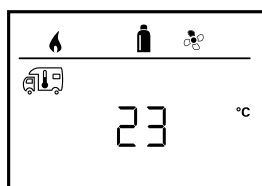


Fig. 11

Select fan level

1. Select the desired fan level with the rotary push button.

8

2. Tap the rotary push button to confirm the value.

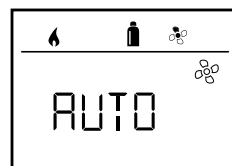


Fig. 12

Select the hot water temperature

1. Select the desired hot water mode with the rotary push button.
2. Tap the rotary push button to confirm the selection.
3. Select the desired hot water temperature with the rotary push button 95 - 120 °F (1 °F increments) or 35-49 °C (1 °C increments).
4. Tap the rotary push button to confirm the value.

Enable time switch ("ON")

1. Enable the time switch (ON) with the rotary push button
2. Tap the rotary push button to confirm the value.

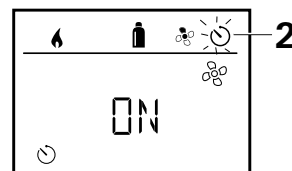


Fig. 13

i The time switch remains enabled, even for several days, until it is disabled ("OFF"). If the time switch is programmed and enabled, the time switch icon flashes.

Disable time switch ("OFF")

1. Tap the rotary push button to go to the setting level.
2. Disable the time switch ("OFF") with the rotary push button
3. Tap the rotary push button to confirm the value.

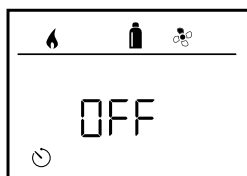


Fig. 14



Set clock

Display 24 h mode

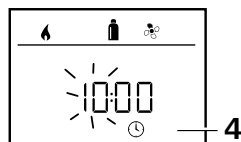
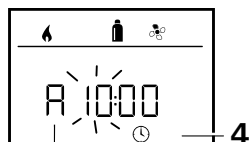


Fig. 15

Display 12 h mode



A = a. m.
P = p. m.

Fig. 16

Use the rotary push button (Fig. 1 – 8) to select the “Set clock” icon in the menu line (Fig. 1 - 4).

The hour display flashes.

1. Use the rotary push button (Fig. 1 – 8) to set the hours.
2. Tap the rotary push button again and the minute display flashes.
3. Use the rotary push button to set the minutes.
4. Tap the rotary push button to confirm the value.



Service menu

1. Calibrate room temperature sensor of the furnace (“OFFSET”)

The room temperature sensor of the connected furnace can be adjusted individually to suit the location of the sensor. Settings can be made in the range from 41 °F to 23 °F (5 °C to -5 °C) in 1 °F (0.5 °C) increments.



Fig. 17

Example:
Set room temperature 75 °F;
OFFSET = -1 °F;
Setpoint for furnace = 74 °F

Default setting: 0 °F (0 °C).

2. AC SET

(Only available if ACC is set to “ON”)

The sensed room temperature can – during operation of the automatic climate control – be perceived differently during cooling than during heating. “AC SET” is used to set an offset between cooling and heating. The setting can be made in increments of 1 °F (0.5 °C) within the range of 0 °F to 10 °F (0 °C to 5 °C).



Fig. 24

Example:

Set room temperature 74 °F;
AC SET = 2 °F
– Setpoint value for air conditioning system = 76 °F

Presetting: +2 °F (+1 °C).

3. ACC

(Only available if the air conditioning system and furnace are connected)

The automatic climate control function AUTO is activated or blocked with “ACC”.

- ON – The automatic climate control function AUTO is activated. Automatic climate control function AUTO can be selected in the Room temperature menu.
– “AC SET” appears in the Service menu.
- OFF – The automatic climate control function AUTO is blocked.



Fig. 25

Presetting: OFF



The function of the Truma automatic climate control depends on proper installation.

4. AquaGo



Available only when AquaGo is connected.

4.1 CALCI

Indicates the relative level of calcification of the AquaGo as a percentage.



With 100 % calcification, the warning “CLEAN” is displayed in the Hot water mode menu (see “Change hot water mode” page 7) and the AquaGo must be decalcified.



4.2 CLEAN

(Only AquaGo comfort / AquaGo comfort plus.)

⚠ WARNING Irritation of skin and eyes in case of contact with decalcification agent. Wear protective gloves, eye protection and face protection to avoid contact.

⚠ WARNING The directions in the AquaGo operating instructions must be followed.

Starts or stops the decalcification process.

i The AquaGo operating instructions contain a complete description of the decalcification process (see "Decalcification").

Start = starting decalcification

Stop = interrupting decalcification

i When the decalcification process is interrupted, the AquaGo is automatically rinsed and can be used only after this.

4.3 HARDN

i The appliance must be decalcified regularly depending on water hardness and hot water consumption.

Specify the hardness of the water that is used. Is needed to display the relative calcification of the AquaGo (see "2.1 CALCI").

Default = 1

Level	Water hardness (mg/l CaCO ₃)
1	Soft 0 - 60
2	Moderately hard 61 - 120
3	Hard 121 - 180
4	Very hard > 180

5. °C / °F temperature display

Select temperature display °C (Celsius) or °F (Fahrenheit).

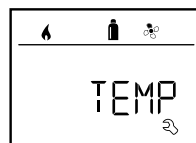


Fig. 18

Default setting: °C (Celsius).

6. Change backlighting

Change the backlighting of the CP plus VarioHeat in 10 increments.



Fig. 19

7. 12 h / 24 h Mode

Display in 12 h (a. m., p. m.) / 24 h mode.

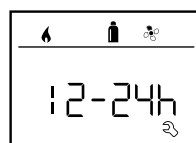


Fig. 20

Default setting: 24 h mode

6. Change language

Select the desired language (German, English, French, Italian).



Fig. 21

Default setting: English

8. Show the version number

Display the version number of the furnace, AquaGo and CP plus VarioHeat .



Example:
H 1.20.01 → H = appliance;
1.20.01 = Version number

Appliance

P = CP plus VarioHeat,
CP plus VarioHeat
CI-BUS
H = VarioHeat
W = AquaGo

Fig. 22

9. RESET

The reset function resets the CP plus VarioHeat to the factory settings. All your settings are deleted. Newly connected devices are recognized and recorded in the control panel.

- Switch on the power supply
– 12 V DC for the CP plus VarioHeat and VarioHeat furnace

Reset

1. Select "RESET" with the rotary push button (Fig. 1 – 8).
2. Tap the rotary push button.
3. "PR SET" is shown in the display.
4. Tap the rotary push button to confirm.



Fig. 23

When you have confirmed the selection, the CP plus VarioHeat is initialized.

"INIT .." appears on the display while this is in progress.

Special displays

External control panel (CI-BUS)

If a command is sent from an external control panel with CI-BUS, "CI" is displayed.

- The CP plus VarioHeat CI-BUS is a separate variant that is fitted only in the factory.

Display energy type

In heating mode, gas (a) is shown as the energy type

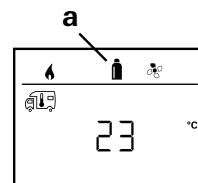


Fig. 24



Warning / Error

Warning

If an operating parameter is outside the target range, the CP plus VarioHeat immediately jumps to the "Warning / Error" menu level and displays the respective fault code. The cause of the warning can be determined and remedied with the aid of the troubleshooting guide (from page 14 and ff).

Return to setting level

- Tap the rotary push button or press the back button. If the display is in stand-by mode, tap to activate the background lighting and tap again to acknowledge the warning.



If possible, the appliance concerned continues to operate. When the operating parameter is within the target range again, this icon extinguishes again automatically.

Display warning code

1. Select the icon ("Fig. 25") with the rotary push button.
2. Tap the rotary push button.
 - The code of the current warning is displayed. The troubleshooting chart (refer to "Troubleshooting" on page 14 and ff) can be used to determine the cause of the warning and remedy the error.

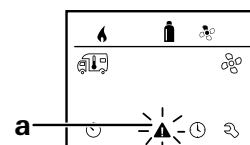


Fig. 25

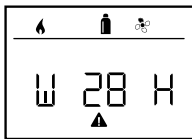


Fig. 26

W = Warning
28 = Error code
H = Appliance
H = VarioHeat
W = AquaGo

Malfunction

In the event of an error, the CP plus VarioHeat immediately jumps to the “Warning / Error” menu level and displays the respective fault code. The cause of the error can be determined and remedied with the aid of the troubleshooting guide (from page 37 and ff).

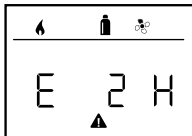


Fig. 27

E = Error
2 = Error code
H = Appliance
H = VarioHeat
W = AquaGo

Cause remedied / return to setting level

- Tap the rotary push button.
– The respective appliance is restarted.



This may take a few minutes due to internal time lags of connected appliances. If the cause was not remedied, the malfunction will occur again and the control panel will again go to the “Warning / Error” menu level.

Cause not remedied / return to setting level

- Press the back button.



In this case, the error is not acknowledged in the CP plus VarioHeat and the warning icon (Fig. 25) remains. The appliance remains in error status. Other connected appliances can be operated.

Reading out the error fault code

When the error has been acknowledged, the fault code can be opened again:

1. Select the warning symbol (Fig. 25) with the rotary push button.
2. Tap the rotary push button. The current error fault code is displayed.

IR remote control

Air conditioning systems – shared use of IR remote control and CP plus VarioHeat

- Even after connecting the CP plus VarioHeat, the IR remote control is still available to control the air conditioning system. The CP plus VarioHeat recognises all settings (except dehumidification mode) that are made on the air conditioning system using the IR remote control. The IR remote control only transmits the settings that are shown in its display (no bidirectional communication).
- Only the time switch of the CP plus VarioHeat may be used to clearly define the start and end time of a required period.

Maintenance

The CP plus VarioHeat is maintenance-free.

To clean the front, you can use a non-abrasive cloth moistened with water (and a neutral soap solution).

Technical data

Display

LCD, monochrome, with backlighting

Diagonal 3.3 in. (84 mm)

Dimensions (L x W x H)

3.62 x 4.06 x 1.58 in. (92 x 103 x 40 mm)

Operating temperature range

13 °F to 140 °F (-25 °C to +60 °C)

Storage temperature range

13 °F to 158 °F (-25 °C to +70 °C)

Interface

TIN bus

CI-BUS (only CI-BUS model)

Power supply

8 – 16.5 V DC

Power consumption

max. 65 mA (100% backlighting)

10 mA (stand-by)

Quiescent current

3 mA (Off)

Weight

approx. 0.22 lb (approx. 100 g)

Protection class

Class III

Protection type

IP00

Subject to change without notice.



Troubleshooting charts

VarioHeat (H)

Error code	Potential cause	Solution
E 2 H, E 16 H	Flame not detected: Gas cylinder empty	Replace gas cylinder
	Gas cylinder or quick-acting valve in the gas supply line closed	Check the gas infeed and open the valves
	Butane concentration in the gas cylinder too high	Use propane. Butane is not suitable for heating, especially at temperatures below 50° F (10 °C)
	Combustion air infeed or exhaust gas outlet closed	Check openings for dirt (slush, ice or leaves) and remove
W 25 H	Excess voltage > 16.4 V DC	Check battery voltage and power sources, such as battery charger
W 26 H	Undervoltage, battery voltage too low < 10 V DC	Charge the battery, replace old battery
W 27 H	Warm air outlets blocked Circulated air intake blocked EN end outlet closed	Remove blockage Remove blockage Open EN end outlet
W 29 H	Imminent undervoltage, battery voltage too low < 10.4 V C	Charge battery
W 255 H	Furnace has no 12 V DC power supply	Ensure 12 V DC power supply
	No connection between furnace and control panel	Connect furnace and control panel

If these measures do not remedy the malfunction or if error codes are displayed that you cannot find in the troubleshooting chart, contact your dealership, Truma Service 1-855-558-7862 or one of our authorized Service Partners.

AquaGo (W)

Error code	Potential cause	Solution
E 1 W	Flame not detected	There is a flame-detection error at the burner because the flame was not detected after release of gas and ignition. Important: The system indicates this error only after three attempts at intervals of approximately 30 seconds.
E 2 W	Error at over temperature switches (EOS, BOS)	The exhaust over temperature switch (EOS) or burner over temperature switch (BOS) is open/unplugged.
E 3 W	Error at exhaust pressure switch (EPS)	The EPS did not close when the flue fan was actuated because the fan did not push enough air through the exhaust channel. A cause could be, e.g., blocking of the exhaust channel or a faulty switch. OR The EPS is closed even though the flue fan is not running. Cause is a defective EPS or flue fan.
E 4 W	Error at water over temperature switch (WOS)	The WOS opened at a water temperature of over 185 °F (85 °C).



Error code	Potential cause	Solution
E 5 W	Flame detected at incorrect time	There is an error in flame detection of the burner because the flame was detected: before ignition or before the release of gas or after the gas was switched off.
E 6 W	Error in the safety circuit for gas valve	There is a heating request but gas cannot be released. One of the switches WOS, EOS, BOS, EPS is open/unplugged.
E 7 W	Error of burner MCU internal RAM	Error detected in the burner MCU's internal safety monitoring feature (safety variables are no longer correct or RAM/STACK was overwritten by mistake).
E 9 W	Malfunction of water outlet temperature sensor WOT	Water outlet temperature sensor WOT has a short circuit or is open/unplugged. the temperature of the sensor is colder than 14 °F (-10 °C).
E 10 W	Error in the safety circuit	There is a heating request but gas is not released because a valve-actuation signal was not activated.
E 11 W	Error of MCU watchdog gas release	There is a heating request but the MCU watchdog does not release the gas path.
W 12 W	Internal error	
W 13 W	Short circuit shut-off valve	Short circuit detection in the gas valve (shut-off part) detected a current > 1000 mA and shut off.
W 16 W	Malfunction of the MCU	Internal error of the control unit.
W 20 W	Malfunction of water inlet temperature sensor WIT	Water inlet temperature sensor WIT has a short circuit or is open/unplugged or the temperature of the sensor is colder than 14 °F (-10 °C).
W 21 W	Malfunction of circulation line temperature sensor WCT	Circulation line temperature sensor WCT has a short circuit or is open/unplugged or the temperature of the sensor is colder than 14 °F (-10 °C).
E 22 W	Malfunction of gas valve, modulation section	Error at gas valve, modulation level, because the modulator has a short circuit or is open/unplugged.
W 23 W	Voltage is too high	The main power supply's voltage detector measured a voltage level of >16.4 V.
W 24 W	Voltage is too low	The main power supply's voltage detector measured a voltage level of <10 V.
E 25 W	Flue fan current consumption error	The current detector for the flue fan has measured a current outside the permitted limits.
W 26 W	Circulation pump current consumption error	The current detector at the circulation pump has measured a current outside the permitted limits.



Error code	Potential cause	Solution
W 27 W	Water circulation pump is running dry.	The circulation pump does not generate water flow. The water system may not be filled or not sufficiently vented. The circulation pump tries (20 times) to generate a water flow every 30 s (if successful, the error is reset).
W 28 W	Too low gas pressure.	Gas supply (in vehicle) to the appliance insufficient.
W 29 W	Too high heat power required.	You are trying to use more hot water than the appliance can supply.
W 30 W	Risk of freezing.	Temperature in the appliance below 27 °F (3 °C).
W 31 W	Decalcification finished.	–
W 32 W	Current too low.	Current in the antifreeze kit too low (e.g. cable break).
W 33 W	Current too high.	Current in the antifreeze kit too high (e.g. short circuit).

If these measures do not remedy the malfunction or if error codes are displayed that you cannot find in the troubleshooting chart, contact your dealership, Truma Service 1-855-558-7862 or one of our authorized Service Partners.

Aventa eco / comfort

Error code	Cause	Remedy
34, 47	Unstable 120 V power supply in connection with generator or inverter operation	Ensure shore power supply 120 V at the unit input

If none of the measures in the troubleshooting chart proves successful or fault codes are displayed that cannot be found in the troubleshooting chart, please contact the Truma Service Center at 1-855-558-7862 or one of our authorized service partners.

In case you encounter any problems, please contact the Truma Service Center at 855-558-7862 or one of our authorized service partners. For details see www.truma.net.

Please have the model number and serial number (on type plate of appliance) handy when you call.



Truma VarioHeat comfort US



LP gas heater

Operating instructions

To be kept in the vehicle.
This document is part of the heater.



Conforms to ANSI Std. Z21.47
Certified to CSA Std. 2.3

⚠ WARNING

FIRE OR EXPLOSION HAZARD

Failure to follow safety warnings exactly could result in serious injury, death or property damage.

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

WHAT TO DO IF YOU SMELL GAS

- **Evacuate all persons from the vehicle.**
- **Shut off the gas supply at the gas container or source.**
- **Do not touch any electrical switch or use any phone or radio in the vehicle.**
- **Do not start the vehicle's engine or electric generator.**
- **Contact the nearest gas supplier or certified service technician for repairs.**
- **If you cannot reach a gas supplier or certified service technician, contact the nearest fire department.**
- **Do not turn on the gas supply until gas leaks have been repaired.**

Installation and service must be performed by a certified service technician, service agency, or the gas supplier.



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California Proposition 65 lists chemical substances known to the state to cause cancer, birth defects, death, serious illness or other reproductive harm. This product may contain such substances, be their origin from fuel combustion (gas) or components of the product itself.

Trademark information

Truma VarioHeat comfort US referred to as VarioHeat below.

Truma CP plus VarioHeat referred to as CP plus VarioHeat below.

Intended use

The VarioHeat may be used only in recreational vehicles (RVs) for heating the room.

Recreational vehicles (RVs) are designed as temporary living quarters for recreation, travel and/or camping. RVs have their own power or are towed by another vehicle.

Prohibited use

Any use other than the intended use (see above) is prohibited.

Examples of prohibited use:

- Use in a marine environment.
- Use as part of a space heating system.
- Use in mobile homes.
- Use in food trucks or roadside food vending vehicles.
- Use in construction trailers.



Mounting arrangement / Accessories

i This is a typical installation for illustration. The installation in your vehicle may vary.
The illustration is not to scale.

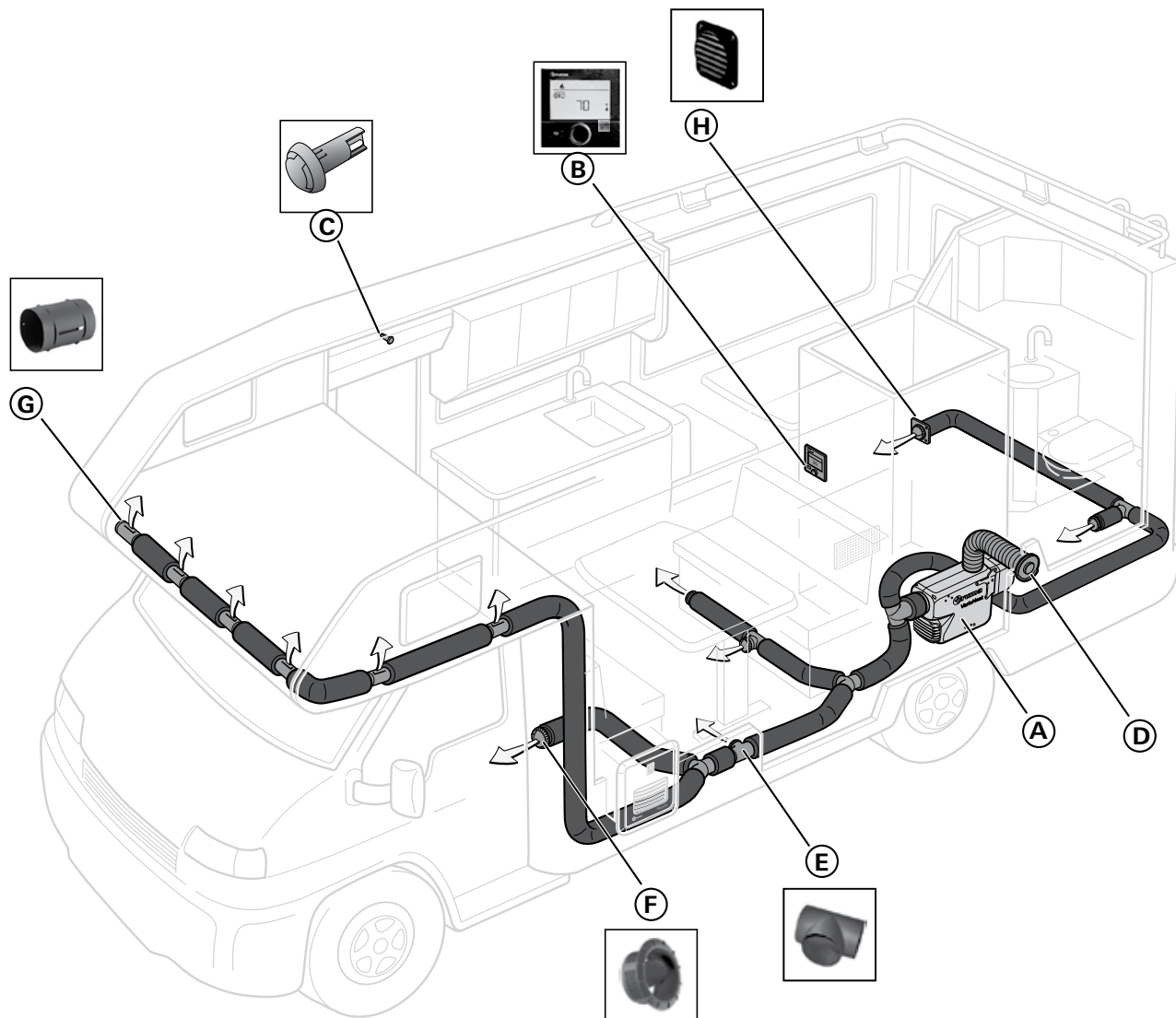


Fig. 1

Legend

- A VarioHeat
- B CP plus VarioHeat
- C Room temperature sensor
- D Exhaust venting system
- E T-piece TS
- F End outlet EN
- G Wall outlet vent WL
- H Swivel air outlet SCW 2



VarioHeat Overview

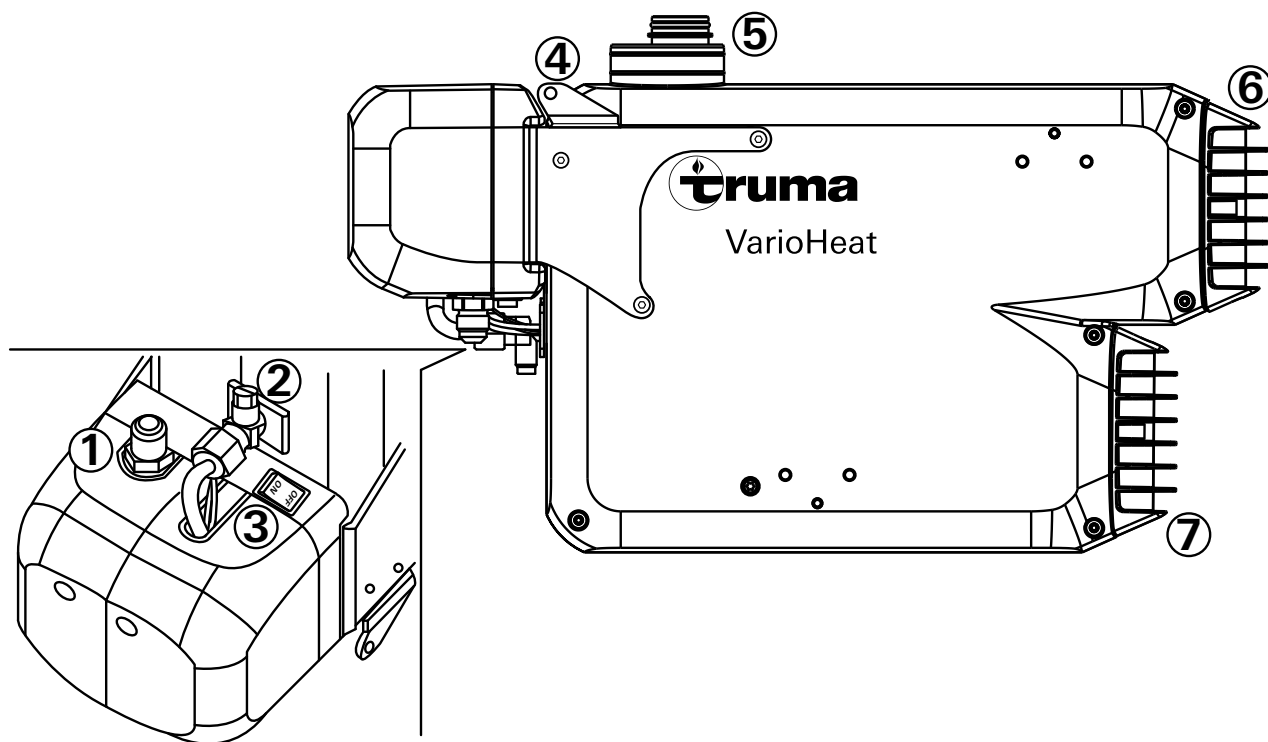


Fig. 2

Legend

- 1 Gas connection
- 2 Gas test pressure point
- 3 Switch for gas shut-off valve
- 4 Retainer
- 5 Exhaust venting system
- 6 Warm air outlet
- 7 Circulated air intake



Consumer Safety Information

Safety symbols and signal words

⚠ This is the safety alert symbol. This symbol alerts you to potential hazards that can kill or hurt you and others.

⚠ DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE is used to address practices not related to physical injury.



Other important information or tips

Safety behavior and practices

Ensuring a safe operating environment

- **⚠ DANGER** Suffocation through exhaust gases To ensure dissipation of exhaust gases, operate the VarioHeat outdoors only.
 - Never use in enclosed spaces or tents or breathe in the exhaust gases.
 - If installing an airtight awning, make sure that the exhaust system terminates to the outdoors.
 - If the RV is parked in an enclosed space:
 - Block the flow of fuel to the VarioHeat.
 - Deactivate the time switch.
 - Switch off the VarioHeat at the control panel.
 - Ensure that the VarioHeat cannot be switched on through the Truma App under any circumstances.
- Use the VarioHeat only with a functional LP gas and carbon monoxide detector installed in the RV. For installation, operation and function test follow the manufacturer's guidelines.
- Keep the area around the VarioHeat free from combustible materials, gasoline, and other flammable vapors or liquids such as pressurized dispensers or wax candles.

- Keep the area in front of the warm air outlets (Fig. 1 – 6) free of combustible or heat-sensitive materials. Do not put any material into the warm air outlets.
- In order to avoid overheating of the VarioHeat, keep the air inlets of the VarioHeat (Fig. 2 – 7), the air openings to the area in which the VarioHeat is installed (Fig. 1) and the spacing around the VarioHeat free of obstruction.
- To ensure clean combustion, keep the wall cowl free of obstruction. Do not lean any objects against the wall cowl (Fig. 1 – D).
- Danger of hot surfaces. The temperature of the exhaust gases can reach 320 °F (160 °C). Do not touch the area around the wall cowl and do not lean any objects against the wall cowl or the RV.

Responsibilities of the operator

- The vehicle owner is responsible for ensuring that the appliance can function properly.
- LPG systems must comply with the technical and administrative regulations of the country in which they are used. National rules and regulations must be observed.

Safe operation

- Use with LP gas (propane) only. Butane or any mixtures containing more than 10 % of butane must not be used.
- Danger of damage to the gas system! For the operation of gas pressure regulation systems, gas-burning devices or gas systems only gas cylinders that supply gas in the gaseous phase may be used. Gas cylinders which supply gas in the liquid phase are prohibited.
- During the initial start-up of a brand new appliance, small quantities of fumes and a slight odor may occur briefly. When the appliance is started up after a particularly long period of non-use, there may be some smoke and/or smell due to dust or dirt. It is a good idea to allow the appliance to run at maximum output for a few minutes and to ensure that the area is well ventilated.
- Hot air can be dangerous, especially for infants, children, the elderly, or infirm. It can cause burns:



- Ventilation air can reach 250 °F (121 °C) at the warm air outlets. Always check the air temperature before varying the air throttle position (Fig. 1 – E,G,H).
- Children up to 17 years of age as well as people with physical, sensory, or mental disabilities and/or people who are inexperienced or unknowledgeable may use the VarioHeat heater only if they are supervised or have been instructed in the safe use. They must also understand the risks associated with using it. Children must not play with the VarioHeat.
- The operating pressure of the gas supply 12 in. wc (30 mbar) and the appliance (see type plate) must match.
- The exhaust double duct must be inspected regularly to ensure that it is not damaged and is firmly connected especially after long trips; the fixing of the appliance and the cowl must also be checked.
- Have a qualified service technician immediately remedy any malfunctions.
 - Remedy a malfunction yourself only if a remedy is specified in the troubleshooting chart in these operating instructions (refer to “Troubleshooting” on page 12).
- After any misfire, a qualified service technician must inspect the VarioHeat and the exhaust tube.

Safe maintenance and repair

- Only a qualified service technician may clean and maintain the VarioHeat.
- Any alteration to the VarioHeat or its controls can cause unforeseen serious hazards and will void the warranty.

Safe operation while moving the RV

- Shut OFF gas and the LPG tank when moving the RV. This disables all gas appliances and pilot lights. Gas appliances must never be operated while vehicle is in motion.
- Shut OFF the VarioHeat when refueling or pumping gas.
- To avoid damage, make sure no spray water enters the VarioHeat when cleaning the RV, e.g., do not spray directly into the wall cowl.

Safe handling of malfunctions

- Switch OFF the gas supply and the VarioHeat if anything seems to be out of the ordinary.
- Danger of fire or explosion when attempting to use a flood-damaged VarioHeat or if the RV has been involved in an accident! A qualified service technician must inspect the VarioHeat. In the case of moisture damage, the qualified service technician must replace damaged gas controls, control system parts and/or electrical parts, or provide a new VarioHeat.
- Only a qualified service technician may perform repairs.



Safety features

The VarioHeat is equipped with the following safety devices:

Switch for gas shut-off valve

The switch (Fig. 2 - 3) shuts off the power to the safety gas valve and the gas supply to the VarioHeat. If you want to make sure that the gas supply to the VarioHeat is off, turn the switch to the OFF position.

Flame monitoring

If the flame goes out, the gas supply is switched off.

Low-voltage shut down

If the voltage drops below 10 VDC, the gas supply is switched off.

Overcurrent protection

If there is a short circuit in the VarioHeat (>10 A), a fuse on the control unit is activated and the VarioHeat is switched off.

Monitoring of hot air temperature

An air over temperature switch avoids excessively high air temperatures.

Operating Instructions

Read and follow the "Consumer Safety Information" before operating the VarioHeat.

NOTICE Danger of faulty operation!
Always use the CP plus VarioHeat control panel to operate the VarioHeat. Operating instructions are supplied with the CP plus VarioHeat control panel.

How the VarioHeat works

VarioHeat is a warm air heater for circulated air mode designed to heat RVs quickly. The appliance automatically selects the proper operating level based on the difference between the desired temperature set at the control panel and the current room temperature.

It also has a boost function for rapid heating and a night function for quiet operation. The different ventilation levels allow air circulation without heating.

Other functions can be selected with the digital control panel, such as a time switch or operation of a Truma AquaGo (refer to the Truma CP plus VarioHeat digital control panel operating instructions).

The appliance always starts at the lowest setting. If this is not sufficient to achieve the desired temperature in the vehicle, the appliance switches to a higher operating level after about 5 minutes.

A wall cowl allows combustion air to flow into the heater and exhaust gas to flow out. The wall cowl and the heater are connected by a tube in the tube exhaust venting system: an exhaust tube inside and a combustion air intake tube outside.



Selectable modes of operation

The CP plus VarioHeat control panel (Fig. 1 – D) is used to switch between modes of operation.

Heating mode

The VarioHeat automatically selects the proper operating level based on the difference between the desired temperature set at the control panel and the current room temperature.

Switch for gas shut-off valve

The switch (Fig. 3) shuts off the power to the safety gas shut-off valve and with this the gas supply to the VarioHeat heater. To make sure that the gas supply to the heater is off, turn the switch to the OFF position.

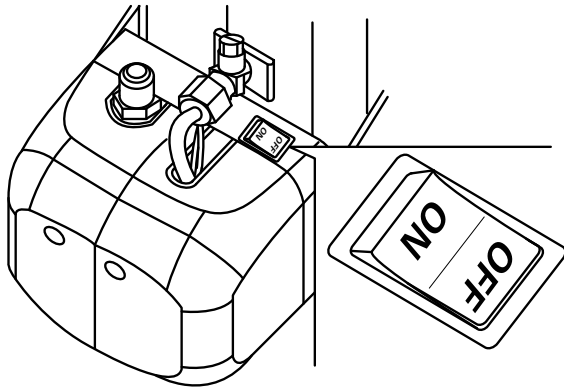


Fig. 3

Gas shut-off valve - switch positions:

Off = gas shut-off valve is closed
On = gas shut-off valve is open

Room temperature sensor

A room temperature sensor (Fig. 1 – C) measures the temperature inside the RV.

The installation location for the room temperature sensor depends on the RV and will be chosen by the RV manufacturer.

Starting the VarioHeat

▲ WARNING

Danger of over-temperature and toxic exhaust gases!

- Use with LP gas (propane) only. Butane or any mixtures containing more than 10 % of butane must not be used.
- Keep the air inlet and exhaust gas outlet free of obstructions. Do not lean any objects against the wall cowl on the RV or place any objects within a range of 2 feet (61 cm) of the wall cowl.

▲ WARNING

Danger of combustion and damage to persons and the RV!

- Keep the area around the VarioHeat free from combustible materials, gasoline, and other flammable vapors or liquids.
- Switch the gas supply and the VarioHeat off:
 - if anything seems to be out of the ordinary.
 - if you smell gas.
 - if you move the RV.
 - before entering a gas station.
 - before entering a tunnel.
 - before entering a ferry boat.

Inspections before each use

Check the VarioHeat for the following points before each use. In case of damage, contact an authorized Truma service provider and do not operate the VarioHeat.

- Inspect the VarioHeat (Fig. 1 – A), exhaust venting system (Fig. 1 – E), and wall cowl (Fig. 1 – E) for damage. Verify that connections are tight and fasteners are secure.
- The wall cowl (Fig. 1 – E) for drawing in combustion air and emitting exhaust must be free from obstructions such as slush, ice or leaves. The heater will not function properly if the combustion-air inlet or exhaust tube is partially or completely obstructed.



- The warm air outlets (Fig. 2 – 6), the wall outlet vents (Fig. 1 – H) and the openings for the circulated air intake (Fig. 2 – 7) must be free from obstructions to ensure that the heater functions properly. Any obstructions might cause the VarioHeat to overheat. If this happens, the built-in temperature limiter will interrupt the flow of gas to the VarioHeat. Once the VarioHeat has cooled, it will switch on again automatically.
- Access to adequate quantities of LP gas (fuel inlet pressure 11 – 13 in. wc (27.4 – 32.4 mbar)) and 12 V power must be available.

Switching on the VarioHeat



For the heater to work properly, there must be enough LP gas (propane >11 in. wc) and 12 VDC power.

1. Switch on the VarioHeat's 12 VDC power supply.
2. Make sure the supply of LP gas is turned on at the tank.
3. Make sure the gas shut-off valve is switched on (refer to "Switch for gas shut-off valve" on page 8).
4. Use the CP plus VarioHeat control panel to switch on the VarioHeat (refer to "CP plus VarioHeat control panel" for additional instructions).

▲ WARNING

Burn injuries caused by hot air!

Ventilation air can reach 250 °F (121 °C) at the warm air outlet and it can cause severe burns or in extreme cases even death.

- Always check the air temperature before varying the Swivel air outlet SCW 2 position (Fig. 1 – H).

5. Use the CP plus VarioHeat control panel to set the desired room temperature.

Shutdown

Switching off the VarioHeat

1. Switch off the VarioHeat heater using the CP plus VarioHeat control panel. Due to internal processes, it may take some time until the VarioHeat is completely shut down.
2. If the VarioHeat and any other gas-powered device is not needed anymore, turn off the LP gas supply.

Truma CP plus VarioHeat control panel

The Truma CP plus VarioHeat digital control panel is described in separate operating instructions.



VarioHeat Technical Data

Fuel	LP gas (propane only)
Inlet pressure	11 – 13 in. wc (27.4 – 32.4 mbar)
Manifold pressure	10 in. wc (24.9 mbar)
Temperature rise	<134 °F (75 °C)

Energy Input Rate / Gas Consumption

LP gas mode	Operating level 1	Operating level 2	Operating level 3
Truma VarioHeat	4700 BTU/h (1.4 kW) 3.5 oz/h (100 g/h)	8900 BTU/h (2.6 kW) 6.7 oz/h (189 g/h)	11500 BTU/h (3.4 kW) 8.6 oz/h (245 g/h)

Power supply

Power consumption at 12 VDC (DC < 1 Vpp)

Truma VarioHeat	5.4 A
-----------------	-------

Shipping weight (without peripheral equipment)

Truma VarioHeat	17.6 lbs. (8.0 kg)
-----------------	--------------------



Truma Gerätetechnik GmbH & Co. KG
("Truma")

"VarioHeat" MANUFACTURER'S LIMITED WARRANTY

(September 2014)

This limited warranty pertains solely to the "VarioHeat" (the "Product") manufactured by **Truma** and sold through its affiliates and dealers in North America.

Truma warrants subject to the below stated conditions that the Product will be free from defects in material and workmanship, and will perform in accordance with the technical specifications set forth in the description of the Product for a period of twelve (12) months for newly manufactured parts from the original date of purchase. The original purchaser is advised to register the Product within two (2) months of purchase at **www.truma.net** in order to receive an extended warranty of an additional twelve (12) months. This limited warranty shall only apply if the Product was properly installed according to the installation instructions provided and in compliance with applicable codes.

During the warranty period, Truma will repair or replace, at its own discretion and costs, the defective Product or parts or components of such Product reported to Truma and which Truma determines was defective due to a warranty defect. Costs of diagnosis for a warranty defect are borne by Truma. Other costs of diagnosis are not included in this warranty. At the discretion of Truma, the replacement of the Product or parts or components thereof (i) may be newly manufactured, (ii) may be assembled from new or serviceable used parts that are equivalent to new parts in performance, or (iii) may have been previously installed.

The customer shall not attempt to repair the Product or resolve the problem without the prior consent of Truma. Any attempt by the customer to repair the Product or resolve the problem without the prior consent of Truma will void this warranty.

This limited warranty does not cover any defects attributable in whole or in part to (i) non-Truma products and services and / or alterations of out-of-specification supplies, (ii) accidents, misuse, negligence or failure of the customer to follow

instructions for the proper use, care and cleaning of the Product, (iii) damages caused in gas pressure regulation systems due to foreign substances in the gas (i.e. oil, plasticizers), (iv) external factors (e.g., fire, flood, severe weather), (v) failure of proper transport packaging, or (vi) failure by the purchaser to comply with Truma's installation and user manual regarding the Product.

All warranty claims must be reported to Truma's authorized warranty service center in the United States:

Truma Corp Service Center,
825 East Jackson Blvd., Elkhart, IN 46516,
toll free: (855) 558-7862, fax. (574) 538-2426,
service@trumacorp.com, www.truma.net

The purchaser shall provide the following information regarding the potential warranty claim (i) serial number of the defective device, (ii) proof of purchase, (iii) purchaser's contact information.

EXCEPT AS EXPRESSLY STATED AND SET FORTH HEREIN, THERE ARE NO WARRANTIES OR REPRESENTATIONS, EXPRESS OR IMPLIED, CONCERNING THE PRODUCT AND NO SUCH WARRANTIES OR REPRESENTATIONS SHALL BE IMPLIED UNDER ANY APPLICABLE LAW, IN EQUITY OR OTHERWISE, INCLUDING WITHOUT LIMITATION, A WARRANTY OF MERCHANTABILITY, A WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, OR ANY OTHER WARRANTY WHICH MAY BE IMPLIED UNDER COMMON LAW OR UNDER THE UNIFORM COMMERCIAL CODE OF ANY STATE OR OTHER JURISDICTION OF THE UNITED STATES OF AMERICA.

Unless further limited herein, the entire liability of Truma and the customer's exclusive remedy for damages from any cause related to or arising out of a warranty defect, regardless of the form of action, whether in contract or in tort, will not exceed the amount of the purchase price for each purchase order for the Product which is the subject matter or directly related to the causes of action asserted.

Unless prohibited under applicable state law, in no event will Truma, its agents, subcontractors, affiliates, suppliers and employees be liable for (a) any incidental, indirect, special or consequential damages, including, but not limited to, loss of use, revenue, profits or savings, substitute rental or for any other reason, even if Truma knew or should have known of the possibility of such losses or damages, (b) claims, demands



or actions against the customer by any person, except as provided by applicable law.

Maintenance and service

Repairs must be performed by a qualified service technician. Truma recommends that the VarioHeat be inspected annually by a qualified service technician.

▲ WARNING

Danger of electrical shock, fire, scalding and/or explosion hazard!

Failure to follow safety warnings exactly and improper servicing could result in dangerous operation, serious injury, death or property damage.

- Before servicing, disconnect all electrical power to the VarioHeat.
- When servicing controls, label all wires prior to disconnecting. Reconnect wires correctly.
- Turn off the LP gas supply at the tank.
- Allow the VarioHeat to cool.
- Verify proper operation after servicing.

▲ CAUTION

Danger of injuries due to sharp edges!

- Always wear protective gloves to avoid injuries from sharp edges during maintenance work.

There are no serviceable parts inside.

In case of a defect please contact the Truma Service Center at 1-855-558-7862 or one of our authorized service partners to replace the complete VarioHeat.

For details see www.truma.net.

Replacing the 12-volt fuse

Only a qualified service technician may perform this task. Please contact your dealership, Truma Service 1-855-558-7862 or one of our authorized Service Partners.

A defective fuse must be replaced with the same make and model of fuse.

10 AT time-lag, 5 X 20 mm. IEC 60127-2 Standard

Troubleshooting



Faults occurring during operation of the VarioHeat heater are displayed as an error code on the CP plus VarioHeat control panel. The potential causes for problems with the VarioHeat are described in separate operating instructions for the CP plus VarioHeat control panel.



Appendix

Warning labels

The following pictures show the labels on the VarioHeat. If any of the labels are missing or unreadable, please contact the Truma Service Center on 1-855-558-7862.



Fig. 33



Fig. 36



Fig. 34



Fig. 37



Fig. 35



Fig. 38



TRUMA VARIOHEAT FURNACE

In case you encounter any problems, please contact the Truma Service Center at 855-558-7862 or one of our authorized service partners. For details see www.truma.net.

Please have the model number and serial number (on heater's type plate) handy when you call.

Manufacturing

Truma Gerätetechnik
GmbH & Co. KG
Wernher-von-Braun-Straße 12
D - 85640 Putzbrunn
Germany
www.truma.com

Sales

Truma Corp
825 East Jackson Blvd.
Elkhart, IN 46516
USA
Toll Free 1-855-558-7862
Fax 1-574-538-2426
service@trumacorp.com
www.truma.net



Models:

D24h-J09, D24f-J09, D32h-J09,
D32f-J04, D40f-J09 & D43f-J04

Safety & Certification

THANK YOU FOR CHOOSING VIZIO

And congratulations on your new VIZIO TV!

To get the most out of your new VIZIO product, read these instructions before using your product and retain them for future reference. Be sure to inspect the package contents to ensure there are no missing or damaged parts.

PRODUCT REGISTRATION

To purchase or inquire about accessories and installation services for your VIZIO product, visit our website at vizio.com.

We recommend that you register your VIZIO product at vizio.com/product-registration.

WHEN READING THIS MANUAL



TIP: When you see this symbol, please read the accompanying helpful tip.



WARNING: When you see this symbol, please read the accompanying important warning or notice. It is intended to alert you to the presence of important operating instructions.

Color Text — This is the TV menu feature you should be selecting.

Grey Text — This is an action for you to complete, such as entering in a name.

➤ — The arrow sign shows the flow of the steps you should take.

1. Lists additional steps you can take for each setting.
 - Bullets give more detailed information about each feature.

IMPORTANT SAFETY INSTRUCTIONS

Your TV is designed and manufactured to operate within defined design limits. Misuse may result in electric shock or fire. To prevent your TV from being damaged, the following instructions should be observed for the installation, use, and maintenance of your TV. Read the following safety instructions before operating your TV. Keep these instructions in a safe place for future reference.

- To reduce the risk of electric shock or component damage, switch off the power before connecting other components to your TV.
- Heed all warnings.
- Follow all instructions.
- Do not use this TV near water.
- Clean only with dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat.
- Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at the ends where the plug is located, near convenience receptacles, or where they exit from the TV.
- Only use attachments/accessories specified by the manufacturer.
- Use only with the stand, tripod, or bracket specified by the manufacturer, or sold with the TV.
- When a cart is used, use caution when moving the cart/TV combination to avoid injury from tip-over.
- Unplug the power cord before cleaning your TV.
- Refer all servicing to qualified service personnel. Servicing is required when the TV has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the TV, the TV has been exposed to rain or moisture, does not operate normally, or has been dropped.



- **CAUTION:** Always use a power outlet that is properly grounded.
- Unplug this TV during lightning storms or when unused for long periods of time.
- When moving your TV from an area of low temperature to an area of high temperature, condensation may form in the housing. Wait before turning on your TV to avoid causing fire, electric shock, or component damage.
- A distance of at least three feet should be maintained between your TV and any heat source, such as a radiator, heater, oven, amplifier, etc. Do not install your TV close to smoke. Operating your TV close to smoke or moisture may cause fire or electric shock.
- Slots and openings in the back and bottom of the TV are provided for ventilation. To ensure reliable operation of your TV and to protect it from overheating, be sure these openings are not blocked or covered. Do not place your TV in a bookcase or cabinet unless proper ventilation is provided.
- Never push any object into the slots and openings on your TV. Do not place any objects on the top of your TV. Doing so could short circuit parts causing a fire or electric shock. Never spill liquids on your TV.
- Your TV should be operated only from the type of power source indicated on the label. If you are not sure of the type of power supplied to your home, consult your dealer or local power company.
- Do not apply pressure or throw objects at your TV. This may compromise the integrity of the TV. The manufacturer's warranty does not cover user abuse or improper installations.
- The power cord must be replaced when using different voltage than the voltage specified. For more information, contact your dealer.
- When connected to a power outlet, power is always flowing into your TV. To totally disconnect power, unplug the power cord.
- The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of un-isolated, dangerous voltage within the inside of your TV that may be of sufficient magnitude to constitute a risk of electric shock to persons.
- Do not overload power strips and extension cords. Overloading can result in fire or electric shock.
- The wall socket should be installed near your TV and easily accessible.
- Only power of the marked voltage can be used for your TV. Any other voltage than the specified voltage may cause fire or electric shock.
- Do not touch the power cord during lightning. To avoid electric shock, avoid handling the power cord during electrical storms.

TELEVISION ANTENNA CONNECTION PROTECTION

The TV shall be installed in accordance with the applicable provisions of Article 810 and Article 820.

If an outside antenna/satellite dish or cable system is to be connected to the TV, make sure that the antenna or cable system is electrically grounded to provide some protection against voltage surges and static charges.

Article 810 of the National Electrical Code, ANSI/NFPA 70, provides information with regard to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of the grounding conductors, location of antenna discharge unit, connection to grounding electrodes, and requirements of the grounding electrode.

Lightning Protection

For added protection of the TV during a lightning storm or when it is left unattended or unused for long periods of time, unplug the TV from the wall outlet and disconnect the antenna or cable system.

Power Lines

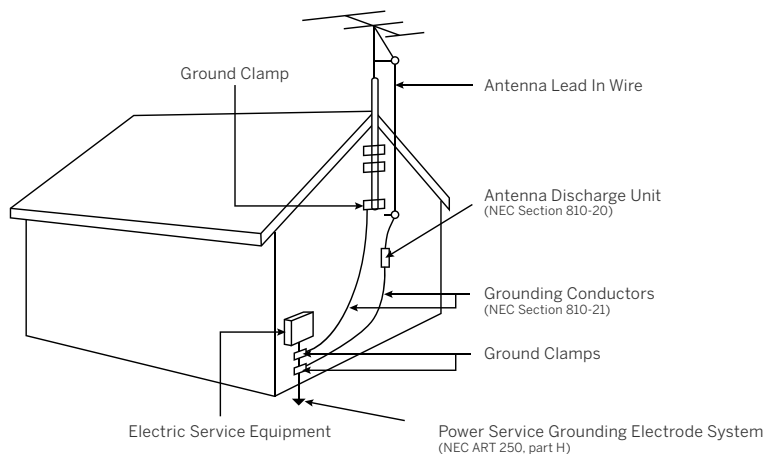
Do not locate the antenna near overhead light or power circuits, or where it could fall into such power lines or circuits. Remember, the screen of the coaxial cable is intended to be connected to earth in the building installation.

Installation of CATV

The installation instructions states the cable distribution system should be grounded (earthed) in accordance with ANSI/NFPA 70, the National Electrical Code (NEC), in particular Section 820.93, Grounding of Outer Conductive Shield of a Coaxial Cable.

Installation of Antenna

The installation instructions states the cable distribution system used for connection to antennas and dishes should be grounded (earthed) in accordance with ANSI/NFPA 70, the National Electrical Code (NEC), in particular Section 810.21, Bonding Conductors and Grounding Electrode Conductors — Receiving Stations.



v



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For DTS patents, see <http://patents.dts.com>.



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vi

Getting to Know Your TV

1

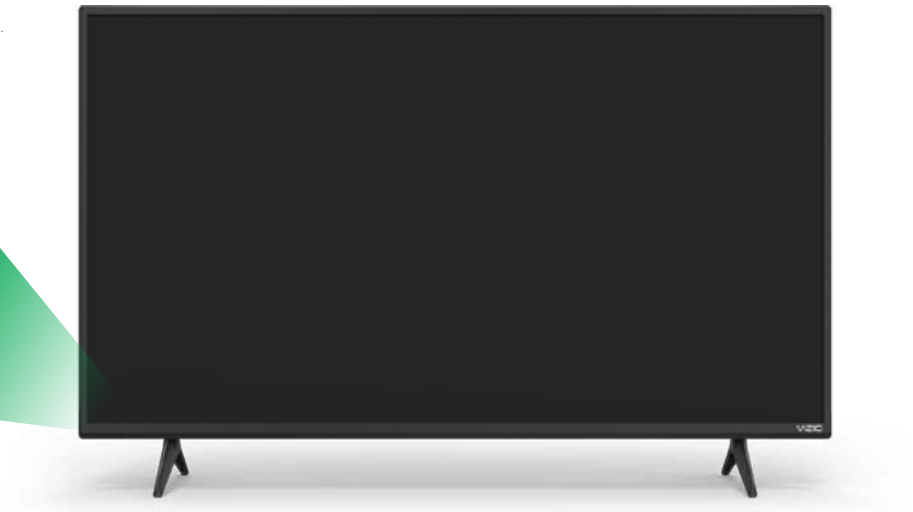
FRONT PANEL

Remote Sensor and Power Indicator
When using the remote, aim it directly at the sensor.
The power indicator flashes on when the TV turns on, then goes out after several seconds.
To keep the power indicator on, see *Turning the Power Indicator On or Off* on page <?>.

POWER/INPUT BUTTON
(located under the sensor)

When TV is OFF:
Press to turn on the TV.

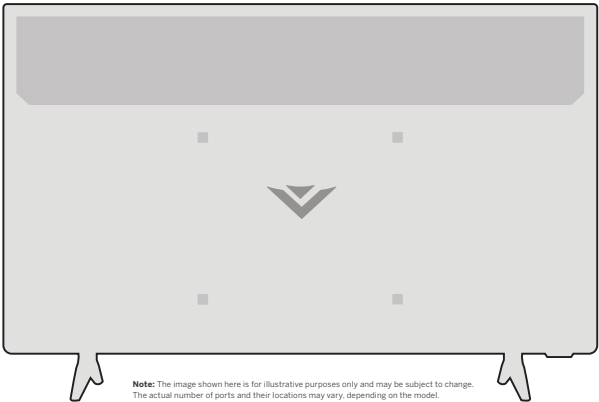
When TV is ON:
Press to change to the next input source.
Press, hold (5 seconds) and release to turn TV off.



1

1


REAR PANEL



Note: The image shown here is for illustrative purposes only and may be subject to change.
The actual number of ports and their locations may vary, depending on the model.

- 

HDMI
Connect an HDMI device
- 

Composite
Connect a composite
- 

Audio Out
Connect to an RCA device, such as sound bar
- 

Coaxial
Connect to a coaxial cable from cable, satellite, or antenna
- 

USB
Connect a USB thumb drive to play photo, music, or video
- 

Optical Audio Out
Connect to an optical/SPDIF audio device, such as home audio receiver
- 

Ethernet
Connect an Ethernet cable to modem/router

2

Connecting a device — AUDIO & VIDEO CABLE TYPES

Your TV can be used to display output from most devices.

1. Verify that your device has a video port that matches an available port on the TV (HDMI, Composite, etc.).
2. Connect the appropriate cable (not included) to the TV and the device.
3. Turn the TV and your device on.
4. Set the TV's input to match the connection you used (HDMI-1, HDMI-2, etc.).

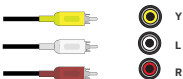
HDMI CABLE



COAXIAL CABLE



COMPOSITE (AV) CABLE



Connecting a device — AUDIO CABLE TYPES

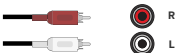
Your TV can be output sound to an audio device, such as a receiver or sound bar.

1. Verify that your device has an audio port that matches an available port on the TV (optical, RCA, etc.).
2. Connect the appropriate cable (not included) to the TV and the device.
3. Turn the TV and your device on.

HDMI CABLE



COMPONENT AND/OR COMPOSITE CABLE



OPTICAL/SPDIF CABLE



Note: The actual ports and their locations may vary, depending on the TV model.

WALL-MOUNTING THE TV

First you will need a wall mount. Consult the provided table below to find the appropriate mount for your TV.

Be sure the mount you choose is capable of supporting the weight of the TV.

To install your TV on a wall:

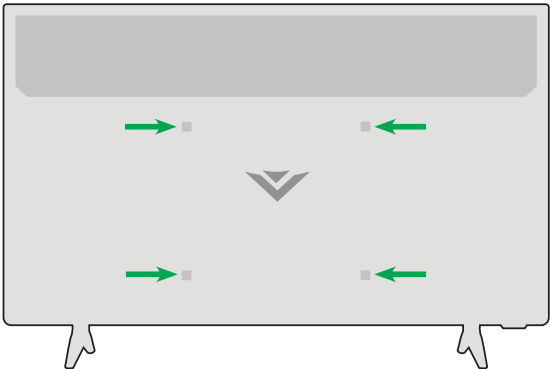
1. Disconnect any cables connected to your TV.
2. Place the TV face-down on a clean, flat, stable surface. Be sure the surface is clear of debris that can scratch or damage the TV.
3. If attached, remove the stands by loosening and removing the screws.
4. Attach your TV and wall mount to the wall by carefully following the instructions that came with your mount. Use only with a UL-listed wall mount bracket rated for the weight/load of your TV.



TIP: Installing a TV on a wall requires lifting. To prevent injury or damage to the TV, ask someone to help you.



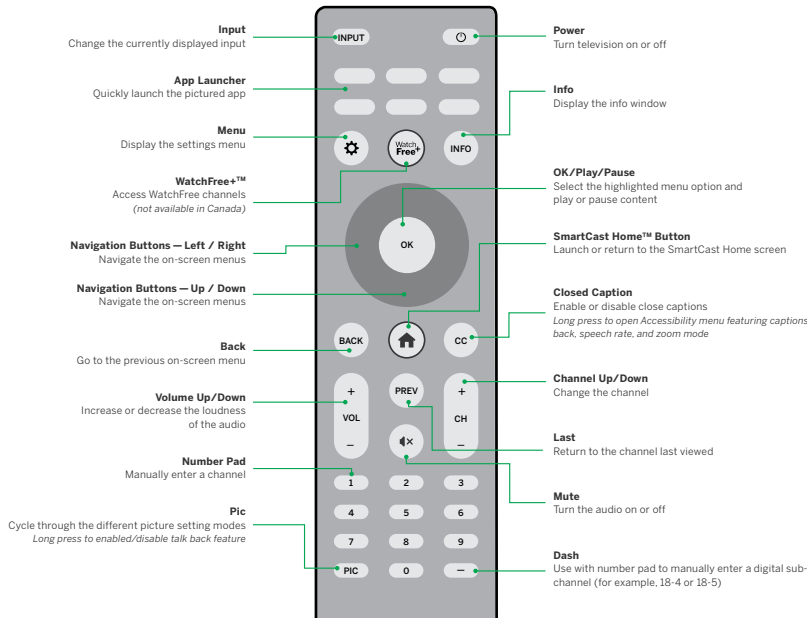
WARNING: Do not use the screws that are included inside the wall mount holes to mount TV.



Note: The image shown here is for illustrative purposes only and may be subject to change. The actual number of ports and their locations may vary, depending on the model.

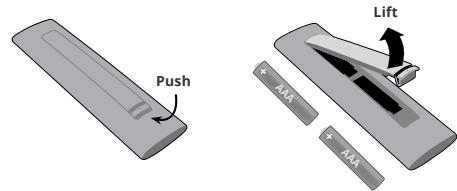
	D24h-J09	D24f-J09	D32h-J09	D32f-J04	D40f-J09	D43f-J04
Screw Size	M4	M4	M4	M4	M6	M6
# of Screws (not included)	4	4	4	4	4	4
Hole Depth	8.5 mm	8.5 mm	7 mm	10 mm	10 mm	13.5 mm
Hole Pattern	100 mm x 100 mm	100 mm x 100 mm	100 mm x 100 mm	100 mm x 100 mm	200 mm x 100 mm	100 mm x 100 mm
Weight w/o Stand	6 lb (2.72 kg)	6 lb (2.72 kg)	8.62 lb (3.91 kg)	8.86 lb (4.02 kg)	12.17 lb (5.52 kg)	14.22 lb (6.45 kg)

USING THE REMOTE

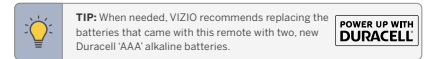
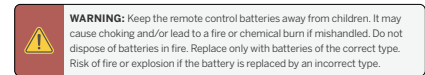


Replacing the Batteries

1. Push the bottom of the battery compartment and lift battery cover to open.
2. Insert two batteries into the remote control. Make sure that the (+) and (-) symbols on the batteries match the (+) and (-) symbols inside the battery compartment.
3. Replace the battery cover and click to close.



In many places batteries cannot be thrown away or discarded with household waste. Please ensure you properly dispose of your batteries consistent with the laws and/or regulations where you live. For more information please visit: www.vizio.com/environment



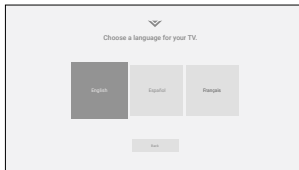
5

Completing the First-Time Setup

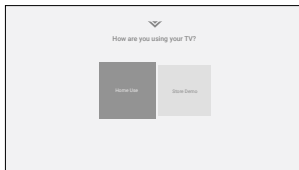
Before you begin the first-time setup:

- Your TV should be installed and the power cord should be connected to an electrical outlet.
- If you have a wireless network, have the network password ready.
- If you are connecting to your network with an Ethernet cable, connect it to the Ethernet port on the TV.

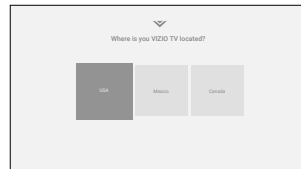
The first time you turn on the TV, the on-screen instructions will guide you through each of the steps necessary to get your TV ready for use:



1. Choose your language. Pressing the CC button will enable TTS (text-to-speech) functionality.



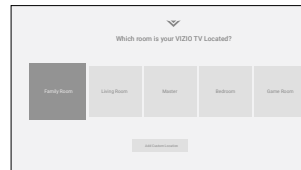
2. Choose home use.



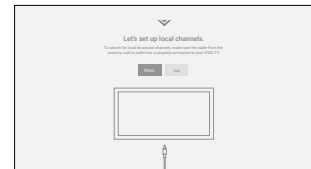
3. Choose your country.



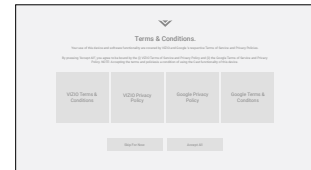
4. Choose your Wi-Fi network and enter the password.



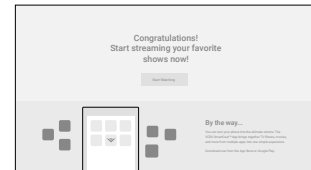
5. Name your TV.



6. Scan for channels.



7. Accept the Terms & Conditions.



8. View and accept Vizio Viewing Data Policy.

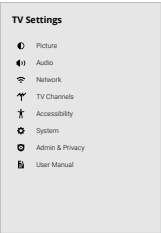
6

Using the On-Screen Menu

3

Your TV features an easy-to-use on-screen menu. To open the on-screen menu, press the **MENU** button on the remote.

- From this menu, you can:
- Adjust the picture settings
 - Adjust the audio settings
 - Adjust the network settings
 - Adjust the TV channel settings
 - Adjust accessibility settings
 - Adjust TV system settings
 - Access admin and privacy settings
 - View the user manual



Navigating the On-Screen Menu

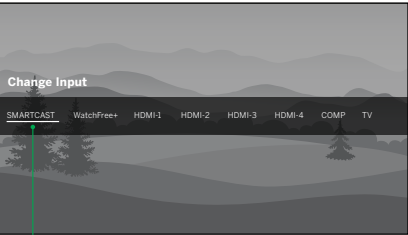
- To open the on-screen menu:
1. Press the **MENU** button on the remote.
 2. Use the **Navigation** buttons to highlight a menu option, and press the **OK** button to select that option.

TIP: While navigating the on-screen menu, you can press the **BACK** button at any time to return to the previous menu screen.

Changing the Input Source

External devices, such as DVD players, Blu-ray players, and video game consoles, can be connected to your TV. To use one of these devices with your TV, you must first change the input source using the input menu.

- To change the input sources:
1. Press the **INPUT** button on the remote. The input menu is displayed.
 2. Use the **Navigation** buttons or the **INPUT** button on the remote to highlight the input you wish to view. The corresponding inputs are named on the back of your TV.
 3. Press **OK** or release the **INPUT** button. The selected input is displayed.



Input Name
The underlined input on the left is the current input selected. Inputs may vary by TV.

TIP: You can change the input names that appear on the Input menu to make your devices easy to recognize. See *Renaming Devices on the Input Menu* on page 22.

7

Adjusting the Picture Settings

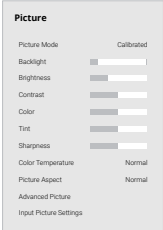
Your TV can be adjusted to suit your preferences and viewing conditions.

To adjust the picture mode settings:
Menu > Picture > Picture Mode

1. Use the **Navigation** buttons on the remote to highlight **Picture Mode**, then use the **Left/Right Navigation** buttons to change the picture mode.
- **Vivid** — Sets the picture settings to values that produce a brighter, more vivid picture.
 - **Bright** — Great for viewing everyday TV, such as news and TV shows, that requires a brighter image with motion enhancements.
 - **Calibrated** — Accurate colors intended for cinema content viewing in a bright room.
 - **Calibrated Dark** — Accurate colors intended for cinema content viewing in a dark room or at nighttime.
 - **Game** — Reduces throughput delays and optimizes the picture settings for displaying game console output. Also the preferred picture mode for computer mode.
 - **Sports** — Sets the picture settings to values ideal for watching sport events with motion control setting.

TIP: If you save changes to the setting for a picture mode, an asterisk will appear after its name. See *Saving a Custom Picture Mode* on page 12.

2. To manually change each of the picture settings, use the **Up/Down Navigation** buttons on the remote to highlight that picture setting, then use the **Left/Right Navigation** buttons to adjust the setting:
- **Backlight (SDR content)** — Adjusts the LED brightness to affect the overall brilliance of the picture.
 - **Brightness** — Adjusts the black level of the picture. When this setting is too low, the picture may be too dark to distinguish details. When this setting is too high, the picture may appear faded or washed out.
 - **Contrast** — Adjusts the white level of the picture. When this setting is too low, the picture may appear dark. When this setting is too high, the picture may appear faded or washed out. If the setting is too high or too low, detail may be difficult to distinguish in dark or bright areas of the picture.
 - **Color** — Adjusts the intensity of the picture colors.
 - **Tint** — Adjusts the hue of the picture. This setting is useful in adjusting the flesh tones in the picture. If flesh appears too orange, reduce the level of color before adjusting tint.
 - **Sharpness** — Adjusts the edge sharpness of picture elements. It can be used to sharpen non-HD (high definition) content; however, it will not produce detail that does not otherwise exist.



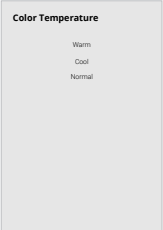
Adjusting the Color Temperature

Adjusting the color temperature changes the white balance of the picture.

To adjust the color temperature:
Menu > Picture > Color Temperature

Use the **Navigation** buttons on the remote to highlight a color temperature preset and then press **OK**.

- **Warm** — Produces an orange-hued picture.
- **Cool** — Produces a blue-hued picture.
- **Normal** — Optimized for television viewing.



8

Changing the Picture Aspect Ratio

To change the screen aspect ratio:
Menu > Picture > Picture Aspect
 Use the **Navigation** buttons to highlight the aspect ratio you wish to view.

- Your TV can display images in different modes:
- **Normal (default)** — No change to aspect ratio.
 - **Panoramic** — Stretches a 4:3 image to fill 16:9 screen with an algorithm so the center doesn't look stretched.
 - **Wide** — Stretches a 4:3 aspect ratio to fill 16:9 screen. If a 16:9 image, adds black bars to top and bottom.
 - **Zoom** — Expands image both horizontally and vertically by 14%.
 - **Stretch** — When the 16:9 signal is a 4:3 image with black bars left and right, stretches to fill the screen.

Some programs have black bars on the top or sides of the screen so that the picture keeps its original shape. Examples include widescreen movies and older TV programs.



TIP: The aspect ratio cannot be changed for Ultra HD content or HDR content.

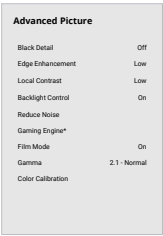
*Available aspect ratio settings may vary by input source. Panoramic mode is only available for standard definition TV (480i/480p) and Stretch mode is only available for high definition TV (720p/1080i/1080p).

Adjusting Advanced Picture Settings

To adjust advanced picture settings:
Menu > Picture > Advanced Picture

Use the **Navigation** buttons to highlight the setting you wish to adjust, then press the **Left/Right Navigation** buttons to change the setting:

- **Black Detail** — Adjusts the average brightness of the picture to compensate for large areas of brightness.
- **Edge Enhancement** — Increases the smoothness of edges.
- **Local Contrast** — Adjust the contrast of the picture locally.
- **Backlight Control** — Dynamically improves the contrast ratio of the picture by adjusting the backlight.
- **Reduce Noise:**
 - **Signal Noise:** Reduces background picture noise when viewing analog sources. This function helps to correct "speckle" noise with a slight reduction in sharpness.
 - **Block Noise:** Reduces the side effects of digital compression such as "blocking" and noise on sharp edges. The High setting will cause a slight reduction in sharpness.



- **Gaming Engine** * — Only applicable to FHD Model.
 - **Game Low Latency:** Reduces video delay (lag) when gaming. When set to Auto and Automatic Low Latency Mode (ALLM) is detected, ALLM will apply for the duration of the game.
 - **Game HDR:** Optimizes picture quality for HDR game.
- **Film Mode** — Optimizes the picture for watching films. Select On or **Off**.
- **Gamma** — Set the shape of the Gamma curve. Use lower Gamma values for bright room conditions, and higher values when it's dark.
- **Color Calibration** — Calibrate colors using HSB, gain, offset and 20 point white balance and test or reset colors to defaults.

Adjusting the Color Tuner Settings

The Color Tuner settings allow you to adjust the color management system, 20 point white balance, turn color channels off for testing, and display SMPTE, flat, ramp, and uniformity analyzer test patterns.

To access the color tuner table:
Menu > Picture > Advanced Picture > Color Calibration > Color Tuner

WARNING: The Color Tuner, White Balance, and test patterns allow technicians to manually calibrate the TV. Calibration requires specialized training, an input with precisely set colors, and a specialized light meter.

To turn color channels off and on:

1. Use the **Navigation** buttons on the remote to highlight **Red**, **Green**, or **Blue**.
2. Press the **OK** button to turn the color channel off or on. An **X** appears over a color channel that has been turned off.
3. Only two color channels can be turned off at the same time.

TIP: Any changes made affect the color temperature setting. Select the preferred color temperature setting first. See *Adjusting the Color Temperature* on page 9.

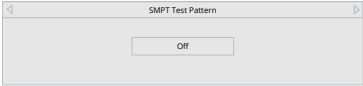
To adjust the color management system settings:

1. Use the **Navigation** buttons on the remote to highlight the Hue, Saturation, Brightness, Offset, or Gain of the color you wish to adjust. Press the **OK** button.
2. Use the **Left/Right Navigation** buttons to adjust the value. When you are finished press the **OK** button to save the setting.

Color Tuner						
	Red	Green	Blue	Cyan	Magenta	Yellow
Hue	0	0	0	0	25	-14
Saturation	-1	5	-4	0	-2	0
Brightness	-24	0	-22	0	0	0

To show or hide the SMPTE Test Pattern:

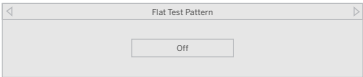
Menu > Picture > Advanced Picture > Color Calibration > Color Tuner > SMPTE Test Pattern



1. Use the **Navigation** buttons on the remote to highlight Off. Use the **Left/Right Navigation** buttons to select On to show the SMPTE Pattern.
2. To hide the SMPTE Test Pattern, use the **Left/Right Navigation** buttons to select Off.

To show or hide the Flat Test Pattern:

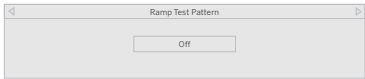
Menu > Picture > Advanced Picture > Color Calibration > Color Tuner > Flat Test Pattern



1. Use the **Navigation** buttons on the remote to highlight Off. Use the **Left/Right Navigation** buttons to select the percentage brightness for the flat test pattern. Selecting a percentage immediately shows the flat pattern at that brightness.
2. To disable the Flat Test Pattern, use the **Left/Right Navigation** buttons to select Off.

To show or hide the Ramp Test Pattern:

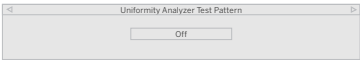
Menu > Picture > Advanced Picture > Color Calibration > Color Tuner > Ramp Test Pattern



1. Use the **Navigation** buttons on the remote to highlight Off. Use the **Left/Right Navigation** buttons to select the color for the ramp test pattern. Selecting a color immediately shows that color ramp.
—or—
2. To hide the Ramp Test Pattern, use the **Left/Right Navigation** buttons to select Off.

To show or hide the Uniformity Analyzer Test Pattern:

Menu > Picture > Advanced Picture > Color Calibration > Color Tuner > Uniformity Analyzer Test Pattern



1. Use the **Navigation** buttons on the remote to highlight Off. Use the **Left/Right Navigation** buttons to select On to show the Uniformity Analyzer Test Pattern.
—or—
2. To hide the Uniformity Analyzer Test Pattern, use the **Left/Right Navigation** buttons to select Off.

To adjust the White Balance Tuner settings:

Menu > Picture > Advanced Picture > Color Calibration > White Balance Tuner

1. Use the **Navigation** buttons on the remote to highlight the Gain and Color values you wish to adjust. Press the **OK** button and use the **Left/Right Navigation** buttons to adjust the value. When you are finished, press the **OK** button to save the setting.

White Balance Tuner				
	Red	Green	Blue	
IREN 5	0	0	0	
Offset	0	0	0	
Gain	0	0	0	

Adjusting Picture Input Settings

Enable HDMI Mode, Full Color 4:4:4, and adjust picture size and position.

To adjust the Input settings:

Menu > Picture > Input Picture Settings

Use the **Navigation** buttons to highlight the setting you wish to adjust.

- **Picture Size and Position** — configure the display size and position of the picture to the screen.
- **Color Space Range** — Select Color Space for the source. Video sources uses YCbCr, but PC uses RGB.

Adjusting the Picture Mode Edit Settings

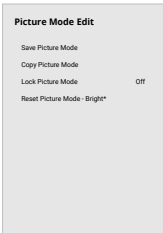
Manage custom picture modes and reset preset picture modes.

To adjust the Picture Mode Edit settings:

Menu > Picture > Picture Mode Edit

Use the **Navigation** buttons to highlight the setting you wish to adjust, then press **OK** to change the setting:

- **Save Picture Mode** — Save a custom picture mode.
- **Copy Picture Mode** — Copy the settings for a custom picture mode.
- **Lock Picture Mode** — Prevent changes to custom picture modes.
- **Reset Picture Mode** — Reset the picture mode settings to factory default values. Only available on customized preset modes.
- **Delete Picture Mode** — Delete a custom picture mode. Inputs assigned to the custom picture mode will use the Calibrated picture mode.



Saving a Custom Picture Mode

Custom picture modes allow you to save a group of custom settings for various viewing conditions and video sources.

To save a custom picture mode:

Menu > Picture > Picture Mode Edit > Save Picture Mode > Enter a Name > Save

Custom picture modes allow you to save a group of custom settings for various viewing conditions and video sources.

- Changes made while on any preset picture mode will add an asterisk on the top right corner of the preset mode.
- The custom picture mode is not automatically saved.



*Only available if there is an input source. Not available for WatchFree.
Menu items will be grayed out if not available.

Copy a Picture Mode

Custom picture mode settings can be copied to be applied to other inputs.

- Complete the desired changes for the selected picture mode.
 - Select **Save Picture Mode** to save picture mode for all inputs.
- Select the input you want to copy your saved picture mode edits to.
- Change the picture mode to your custom saved mode: **Menu > Picture > Picture Mode > select saved custom picture mode**
- Copy your custom picture mode: **Menu > Picture > Picture Mode Edit > Copy Picture Mode**
- Select what picture mode you would like to copy over.
- A notification displays after the copy to your selected picture mode is completed. Now this picture mode will have your custom settings saved over it for the selected input.
- Repeat as needed to customize additional inputs.

Lock a Picture Mode

Custom picture modes can be locked/unlocked with a unique PIN to prevent accidental changes to their settings. If not previously set, you can set up your system PIN code here.

To lock all custom picture modes:

Menu > Picture > Picture Mode Edit > Lock Picture Mode > On > Enter Your PIN > Save

To unlock all custom picture modes:

Menu > Picture > Picture Mode Edit > Lock Picture Mode > Off > Enter Your PIN

Lock Picture Mode

Create a picture control PIN to prevent changes to all custom picture modes.

Enter PIN:

Confirm PIN:

TIP: To set a custom PIN code, see *Setting a System PIN Code on page 24*.

Deleting a Picture Mode

Custom picture modes that are no longer needed can be deleted.

TIP: Inputs assigned to deleted custom picture modes become assigned to the Calibration picture mode.

To delete a custom picture mode:

Menu > Picture > Picture Mode Edit > Delete Picture Mode > Delete

To delete the user created Custom 1 picture mode, select the Delete button.

Resetting a Picture Mode

A preset picture mode that has been edited can be restored to the factory default settings.

To reset a customized preset picture mode:

Menu > Picture > Picture Mode Edit > Reset Picture Mode > Reset

ADJUSTING THE AUDIO SETTINGS

To adjust the audio settings:

Menu > Audio

Use the Navigation buttons to highlight the setting you wish to adjust, then press **Left/Right Navigation** buttons to change the setting:

- TV Speakers** — Built-in speakers automatically turn off if a sound bar is discovered. Turn the built-in speakers On or Off.
- Surround Sound** — When set to On, enables surround sound suitable for sports and TV shows. VirtualX™ adds virtualized height best for movies.
- Volume Leveling** — When set On, DTS TruVolume™ audio solution levels the speaker volume.
- Balance** — Balance the audio loudness between the left and right speakers.
- Bass** — Increase or decrease the bass level.
- Treble** — Increase or decrease the treble level.

Audio

TV Speakers: Auto

Surround Sound: On

Volume Leveling: On

Balance:

Bass:

Treble:

Lip Sync:

Digital Audio Out: Auto

Analog Audio Out: Fixed

Dialogue Enhancer: Off

- Lip Sync** — Synchronize the display image with the audio track.
- Digital Audio Out** — Select the digital audio output format for both the optical and HDMI ARC audio devices.

TIP: You must select **Digital** for audio with more than two channels (e.g., 3.0, 5.0, or 5.1).

To hear talk back when Talk Back function is enabled, digital audio out must be set to PCM.

- Analog Audio Out** — Select Variable if you are controlling the volume with the remote. Select Fixed if an external audio device (sound bar or AV receiver) will control the volume.
- Dialogue Enhancer** — If enabled and the signal source includes Dolby 5.1 AC-4 audio then clarity of dialogue is enhanced.

SOUND BAR SETTINGS

If a VIZIO sound bar is detected and connected via CEC (HDMI ARC/eARC), sound bar settings will appear.

To adjust the sound bar settings:

Menu > Audio > Sound Bar Settings

Use the Navigation buttons to highlight the setting you wish to adjust, then press **Left/Right Navigation** buttons to change the setting.

TIP: Available sound bar menu settings will be specific to the type of VIZIO sound bar connected. See *Adjusting the CEC Settings on page 25* to enable CEC under the SYSTEM settings.

ADJUSTING THE NETWORK SETTINGS

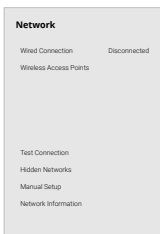
Your TV is Internet-ready, featuring both an Ethernet port and built-in high-speed wireless internet.



Connecting to a Wireless Network

To connect to a wireless network whose network name (SSID) is being broadcast:

Menu > Network >
Choose your network >
Enter in the password > **Connect**



To forget a saved network:

Highlight a saved wireless access point > **OK** > **Forget**

If you do not see your wireless network displayed, click on:

More Access Points > Highlight your wireless network > Enter in the password > **Connect**

Testing Your Network Connection

To test your network connection:

Menu > Network > Test Connection

Connecting to a Hidden Network

To connect to a wireless network whose network name (SSID) is not being broadcast:

Menu > Network > Hidden Network > Enter the Access Point Name > Connect > Enter in the password



Changing the Manual Setup Settings

Advanced users can fine-tune the network settings using the Manual Setup feature. The security settings on your router may require you to enter the TV's MAC address.

To change advanced network settings:

Menu > Network > Manual Setup > DHCP > Off

1. Use the **Navigation** and **OK** buttons to adjust each setting:

- **IP Address** — The IP address assigned to the TV.
- **Subnet Mask** — The subnet Exit 2D.
- **Default Gateway** — Your network's default gateway address.
- **Pref. DNS Server** — Your preferred domain name server address.
- **Alt. DNS Server** — Your alternate domain name server address.

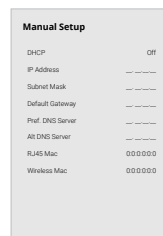
2. Use the **Navigation** buttons on the remote to highlight **Save** and press **OK**.

To find the TV's MAC address:

Menu > Network > Manual Setup

You can find your TV's MAC address at the bottom of the list. The MAC addresses for the connections in use are displayed:

- **RJ45 MAC** — The Ethernet or RJ45 MAC address may be needed to set up your network when you have connected the TV to your network when you have connected the TV to your network with an Ethernet (Cat 5) cable.
- **Wireless MAC** — The Wireless (Wi-Fi) MAC address may be needed to connect your TV to your network with Wi-Fi.



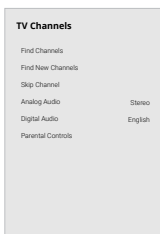
To view network information

Menu > Network > Network Information

SETTING UP TV CHANNELS

You can use the TV's Channels menu to:

- Find channels
- Find new channels
- Select channels to skip
- Select analog audio mode
- Select the language for digital audio
- Set parental controls



Scanning for TV Channels

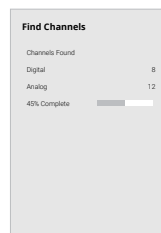
The TV may need to scan for channels before it can display programs and their associated information. A channel scan is required for free over-the-air channels (using an antenna) and cable channels from an out-of-the-wall connection (without a cable box). Moving the TV to an area with different channels requires the TV to scan for channels again.

To perform an Auto Channel Scan:

Menu > TV Channels > Find Channels

Wait until the channel scan is 100% complete. Highlight **Done** and press **OK**.

- If the channel scan is canceled, the channels that were already discovered are retained.



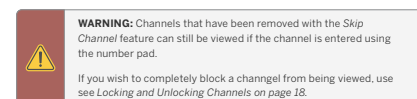
To perform a New Channel Scan:

Menu > TV Channels > Find New Channels

A New Channel Scan saves the current channel map and scans for additional channels.

Skipping Channels

After a channel scan is completed, you may find that some channels are too weak to watch comfortably. There may also be some channels you do not want to view. You can remove these channels from the TV's memory with the Skip Channel feature.



To remove a channel:

1. From the TV CHANNELS menu, highlight **Skip Channel**, and press **OK**. The SKIP CHANNEL menu is displayed.
2. For each channel you wish to remove, use the **Up/Down Navigation** buttons on the remote to highlight the channel and press **OK**. A ✓ appears to the right of each channel you select.

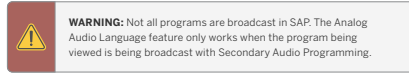


Changing the Analog Audio Language

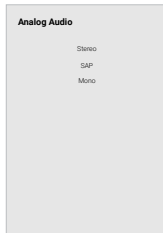
Some analog over-the-air (free) and cable channels broadcast programs in more than one language. The TV's Analog Audio feature allows you to listen to audio in an alternate language using Secondary Audio Programming (SAP).

To use the Analog Audio feature:

Menu > TV Channels > Analog Audio



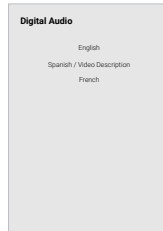
- **Stereo** — More than one speaker channel is being used. Sounds may be dispersed through different speakers depending on how the audio is programmed.
- **SAP (Secondary Audio Program)** — Typically used for audio in a different language other than the native one used in the program.
- **Mono** — All speakers are producing the same sound; there is no distinction between left or right sounds.



To use the Digital Language feature:

Menu > TV Channels > Digital Audio

Select the preferred audio language. Available languages or video description depend on the broadcast content.



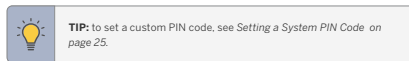
Using Parental Controls

The TV's parental controls allow you to prevent the TV from displaying certain channels or programs unless a PIN is used.

Accessing the Parental Controls Menu

To access the Parental Controls menu you must first set up a system PIN:

Menu > TV Channels > Parental Controls > Enter in PIN



The **Parental Controls** menu only appears when:

- You are using the tuner to receive your TV signals, such as when you are using an antenna for Over-the-Air signals or when connected to cable TV directly from the wall (no cable box).
- You have a device connected using a composite video cable or a coaxial cable, such as a VCR, satellite or cable box, or DVR.



Enabling or Disabling Program Ratings

To manage program content according to its rating, you must first enable the Program Rating feature.

To enable or disable the Program Rating feature:

Menu > TV Channels > Parental Controls > Locks > Off/On



Locking and Unlocking Channels

When a channel is locked, it cannot be accessed. Locking a channel is a good way to prevent children from viewing inappropriate material.

To lock or unlock a channel:

Menu > TV Channels > Parental Controls > Channel Locks

Highlight the channel you want to lock or unlock and press **OK**.

- When a channel is locked, the Lock icon appears  locked. The channel is not accessible unless the system PIN is entered.
- When a channel is unlocked, the Lock icon appears  unlocked.

Blocking and Unblocking Content by Rating

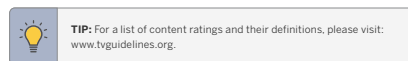
A channel may sometimes broadcast programs that are meant for a variety of audiences (some for children and some for adults). You might not want to block the channel completely using a channel lock, but you can block certain programs from being viewed.

You can use the TV's Rating Block feature to block content based on its rating.



To block or unblock content by its rating:

1. From the Parental Controls menu, highlight the content type you want to adjust and press **OK**:

- **USA TV** — USA television program broadcasts.
- **USA Movie** — USA movie broadcasts.
- **Canadian English** — Canadian English television program broadcasts.
- **Canadian French** — Canadian French television program broadcasts.



2. For each rating type you want to block or unblock, use the **Navigation** buttons to highlight the rating type and press **OK**.

- When the rating type is **blocked**, the Lock icon appears  locked. Content with this rating and all higher ratings cannot be viewed.
- When the rating type is **unblocked**, the Lock icon appears  unlocked. Content with this rating and all lower ratings can be viewed.
- If you want to block all unrated content, highlight Block Unrated Shows and use the Navigation buttons on the remote to select On.

To enable or disable the Block Unrated Shows setting:

Menu > TV Channels > Parental Controls > Block Unrated Shows > Off/On

Reset Locks

Reset all locks to default and clear all channel or ratings locks to the unlocked state.

To reset locks:

Menu > TV Channels > Parental Controls > Reset Locks

ACCESSIBILITY SETTINGS


VIZIO is committed to providing intuitive, user-friendly products. Your new VIZIO TV offers several accessibility features that can help you with easy navigation.

To access the Accessibility menu:

Menu > Accessibility

1. **Captions** — Activate and customize analog and digital closed captions.
2. **Video Description** — If included by the broadcaster, provides a narrated description of the action for the content.
3. **Talk Back** — Enables your TV to speak all settings changes and adjustments using the remote in English.
4. **Speech Rate** — Adjusts the rate in which Text-to-Speech is spoken. Select Slow, Normal (default), or Fast.
5. **Zoom Mode** — Enlarges a section of the screen by approximately 200%.

Accessibility	
Captions	Off
Video Description	Off
Talk Back	Off
Speech Rate	Normal
Zoom Mode	Off



TIP: You can also enable/disable accessibility features using the included remote. See *Using the Remote* on page 5.


To access the Video Description menu:

Menu > Accessibility > Video Description > Off/On

*Available only in English.

Setting Up Closed Captioning

Your TV can display closed captions for programs that include them. Closed captions display a transcription of a program's dialogue.



TIP: Closed Captioning is available for tuner, composite and streaming content (if supported by the app). Note that most apps will support their own CC from within the app.

To activate or deactivate Close Captions for current content:


Menu > Accessibility > Captions > Closed Captions > Off/On

— or —

Push the CC button  on the remote.

1. Use the **Navigation** buttons on the remote to highlight either Analog or Digital Closed Captions.
2. Use the **Left/Right Navigation** buttons on the remote to select the caption channel you wish to display.

Closed Captions	
Closed Captions	Off
Analog Closed Captions	CC1
Digital Closed Captions	CS1
Digital Style	



TIP: The Closed Captions menu does not appear when an HDMI input is selected. Close captions are available when using the tuner or a composite video cable.

Changing the Appearance of Digital Closed Captions

Digital closed captions can be displayed according to your preference. See the diagram on the next page for an explanation of the parts of the closed caption area.

To change the appearance of digital closed captions:

Menu > Accessibility > Captions > Digital Style

1. Use the **Left/Right Navigation** buttons on the remote to select Custom. The Digital Style menu appears as shown.

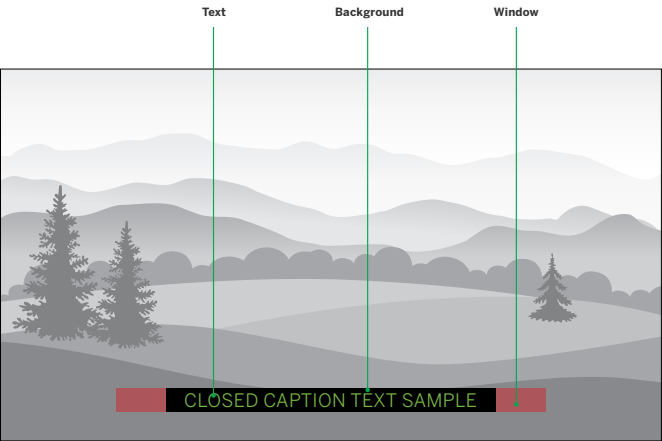
2. Use the **Up/Down Navigation** buttons on the remote to highlight the setting you wish to change, then use the **Left/Right Navigation** buttons to change the settings (choose "As Broadcast" to keep default setting):
- **Text Style** — Change the font used for the closed captioning text.
 - **Text Size** — Make the text larger or smaller.
 - **Text Color** — Change the color of the text.
 - **Text Opacity** — Change the transparency of the text.
 - **Text Edges** — Change the effects at the edges of the text, such as raising the edges or adding drop shadows.
 - **Text Edges Color** — Change the color of the text edge effects.
 - **Background Color** — Change the color of the background directly behind the text.
 - **Background Opacity** — Change the transparency of the background directly behind the text.
 - **Window Color** — Change the color of the closed captioning box.
 - **Window Opacity** — Change the opacity of the closed captioning box.

Digital Style	
Text Style	As Broadcast
Text Size	Large
Text Color	Blue
Text Opacity	As Broadcast
Text Edges	As Broadcast
Text Edges Color	As Broadcast
Background Color	As Broadcast
Background Opacity	As Broadcast
Window Color	As Broadcast
Window Opacity	As Broadcast

Typical choices include:

- **Opaque background, transparent window** — Only a strip of background appears behind the text, expanding as the text appears. This is the typical "As Broadcast" mode.
- **Opaque background and window in the same color** — When text appears, the entire line fills with color at once.

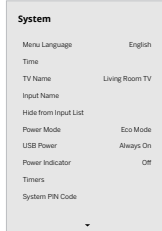
In the example, the closed caption text is green, the background is black, and the window is red.



CHANGING THE SYSTEM SETTINGS

Using the System menu, you can:

- Change the on-screen menu language
- Set the time zone and local settings
- Name the TV
- Name an input
- Hide inputs not in use
- Adjust the power mode settings
- Set the USB power mode
- Turn the power indicator on or off
- Set up timers
- Set a system PIN code
- Adjust CEC settings
- Manage paired devices
- Manage a voice remote control

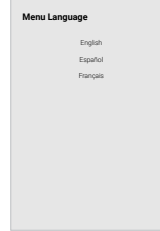


Changing the On-Screen Menu Language

Your TV can display the on-screen menu in different languages.

To change the on-screen menu language:
Menu > System > Menu Language

Highlight your preferred language (English, Español, or Français) and press **OK**.



Setting the Time

To ensure the correct time is displayed when you press the **INFO** button, set the TV's time zone:

Menu > System > Time > Time Zone

To turn Daylight Saving Time on or off:

1. Highlight Daylight Saving Time and press **OK**. The Daylight Saving Time menu is displayed.
2. Choose **On** if it is currently Daylight Savings Time, **Off** if it is Standard Time, or **Auto** to have the system automatically detect Daylight Savings Settings.

To change Time Format:

1. Highlight Time Format and use the **Left/Right Navigation** buttons to change between a 12-hour format or 24-hour format.

Changing the TV Name

Naming your TV helps differentiate it from other cast devices you may have in your home.

To edit your TV name:

Menu > System > TV Name > Enter a Name



Renaming Devices on the Input Menu

You can rename the inputs to make them easier to recognize on the Input menu. For example, if you have a DVD player connected to the HDMI-1 input, you can rename that input to display "DVD Player."

See *Changing the Input Source* on page 7.

To change the name of an input:

Menu > System > Input Name

To enter a custom name:

- Highlight the **Name Input** row and press **OK**.
- Enter your custom label using the on-screen keyboard and press **OK**.



TIP: The current input you are on will be the input name you are changing. You cannot change every input (i.e. WatchFree or SmartCast inputs).

To hide an Input from the List:

Menu > System > Hide from Input List

- Highlight the input name you would like to hide. Hidden inputs will not be displayed in the input list.
- Use the Left/Right Navigation buttons to toggle from visible and hidden.

Adjusting the Power Mode

Your TV is set to Eco Mode by default. When the TV is powered off, the Eco Mode setting uses less than 0.5W of power. Quick Start Mode enables your display to power on faster and also to turn on when powered from another device (such as when you are casting onto the TV).



WARNING: Please note that by changing this setting the energy consumptions required to operate this device will change.

To switch between Eco Mode and Quick Start Mode:

Menu > System > Power Mode

Highlight either Eco Mode or Quick Start Mode and press **OK**.



TIP: If you want to use a voice assistant to turn your TV on, make sure Quick Start Mode is turned on.

Using the USB Power Feature

The USB port can be used to charge devices.

The two options for this feature are:

- **Always On** — Power is always available.
- **Off When TV Off** — Power is only available with the TV is on.



Turning the Power Indicator On or Off

The power indicator on the front of your TV normally does not glow when the TV is on. You can change this setting if you prefer the light to be on.

To turn the Power Indicator Light On or Off:

Menu > System > Power Indicator > Off/On

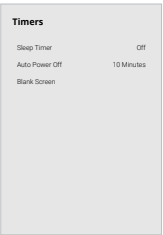
Setting Timers

When activated, the TV's timer will turn the TV off after a set period of time.

To setup a sleep timer:

Menu > System > Timers > Sleep Timer

Use the **Left/Right Navigation** buttons on the remote to highlight the period of time after which you want the TV to go to sleep: 30, 60, 90, 120, or 180 minutes. If you don't want the sleep timer to activate, change the setting to Off.



Setting the Auto Power Off Feature

To help save energy, your TV is set by default to turn off after 10 minutes without a video or audio signal. This feature can be deactivated.

To set the Auto Power Off feature:

Menu > System > Timers > Auto Power Off > Off

Using the Blank Screen Feature

To help save LED life, your TV screen can turn on or off while audio is streaming.

To use the Blank Screen feature:

Menu > System > Timers > Blank Screen

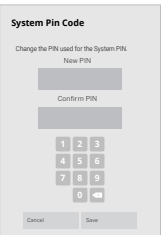
To **exit** Blank Screen, press any key (except the volume and mute keys).


Setting a System PIN Code

You can set a system pin to lock content and picture modes, as well as prevent accidental system resets. The first time you select System PIN code, you will need to create a PIN.

To create a PIN:

Menu > System > System PIN Code > Enter Your PIN > Save





WARNING: You will need to enter your current PIN code the next time you access this menu or if you'd like to change your PIN.

Adjusting the CEC Settings

The CEC function on your TV enables you to control devices connected to an HDMI input with the VIZIO TV remote, without any programming

Menu > System > CEC

Select a setting and then press **OK**.


- **CEC** — To use CEC, you must select Enable.
- **Device Discovery** — To determine if your device is connected and supports CEC, select Device Discovery and then press **OK**.

CEC Audio Setup

Connect your audio device to the HDMI-1 (HDMI ARC) input on the TV. On your audio device, select the HDMI ARC input.

Using CEC, your VIZIO TV remote can control such features including (depending on specific device):

- Power On/Off
- Volume and mute
- Play and pause



WARNING: Not all HDMI devices support CEC. See your device's user manual for details.

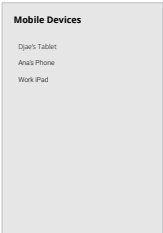
Managing Mobile Devices

Your TV can be paired with a mobile device so you can easily control your TV across multiple devices.

To see a list of paired devices or unpair a device:

Menu > System > Mobile Devices

Highlight a device name to delete it and press **OK**.

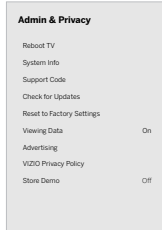


USING THE ADMIN & PRIVACY MENU

You can use the TV's Admin & Privacy menu to restore the TV to its factory default settings as well as access other administrative settings.

Using the ADMIN & PRIVACY menu, you can:

- Force the system to power off and on
- View system information
- View a customer service support code
- Check for system updates
- Reset the TV to factory settings
- Enable or disable viewing data
- Personalize advertising choices
- View the VIZIO Privacy Policy
- Start or stop the store demo mode



Performing a Reboot

A reboot forces the TV to turn off then on again.

Menu > Admin & Privacy > Reboot TV

Viewing System Information

To view technical data and status information about your TV and network connection:

Menu > Admin & Privacy > System Information

Accessing the Support Code

Retrieve a customer service support code/PIN or access basic TV information to assist in a customer service interaction.

To retrieve your support code:

Menu > Admin & Privacy > Support Code

Checking for System Updates

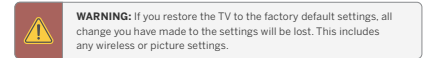
To check for a system update:

Menu > Admin & Privacy > Check for Updates

If an update is found, the TV will ask to confirm the update. If no update is found, the screen will note *The TV is up-to-date*.

Restoring the TV to Factory Default Settings

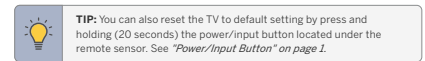
All of the on-screen menu settings can be reset to the factory defaults.



To restore the TV to its factory default settings:

Menu > Admin & Privacy > Reset to Factory Settings

1. If you set a system PIN code, enter it now.
2. The TV displays, "Select Reset to restore all TV settings to factory defaults."
3. Highlight **Reset** and press **OK**.
4. Wait for the TV to turn off. The TV will turn back on shortly afterward and the setup process will begin.



Viewing Data

To turn viewing data on or off:

Menu > Admin & Privacy > Viewing Data

Use the Left/Right Navigation buttons to toggle from on or off

About Viewing Data

WHAT DATA DOES ACR TECHNOLOGY COLLECT?

When enabled, ACR technology will collect information about the audio and video programming content playing on this internet-connected display unit including broadcast television, advertisements and other commercially available content. We associate this Viewing Data with the IP address for the unit, and a unique device number we assign. You may change your Viewing Data settings at any time within the Settings Menu of your TV. Declining Viewing Data collection will not change the functionality of your device.

WHO DO WE SHARE VIEWING DATA WITH?

When enabled, we share Viewing Data with authorized data partners. We license Viewing Data to analytics companies, media companies, advertisers, ad agencies, and other ad tech companies who measure ad effectiveness or aid personalization of ads. Our authorized cloud service providers may also store this data on and solely on our behalf, and for no other purposes.

WHAT DO WE DO WITH VIEWING DATA?

VIZIO or its authorized data partners may combine Viewing Data with household demographic data, or other data about your digital actions, like smartphone location, web histories or offline purchases, in order to determine the effectiveness of a particular ad, or choose which ads are likely to be useful or timely, including during broadcast, cable, satellite, or internet based television programming. VIZIO and its authorized data partners also use the information to generate summary analysis and reports of how users engage with content on their TVs and other devices.

WHAT ELSE DOES VIEWING DATA SHARING MEAN FOR YOU?

Viewing Data is also used to help content publishers, broadcasters or content distribution services create or recommend more relevant entertainment based on summary insights. For example, if devices sharing your IP address suggest an interest in music, fitness, or sports related topics, advertisers might deliver tailored ads to this display unit or other devices associated with your IP address.

You can easily turn this feature On or Off in the ADMIN & PRIVACY menu. If you have trouble enabling or disabling Viewing Data, please contact VIZIO Customer Support by going to support.vizio.com and selecting **Contact Us**.

For more information, see vizio.com/viewingdata and review VIZIO's privacy policy at vizio.com/privacy.

Managing Advertising Settings

Your advertising choices can be personalized.

Limited Ad Tracking

When enabled, TV Ad ID will not be passed or used for personalized ads on this device.

To turn on or off:

Menu > Admin & Privacy > Advertising > Limited Ad Tracking

- Use the **Left/Right Navigation** buttons to toggle from on or off

Reset TV Advertiser ID

An Identifier for Advertising — can be reset to a new identifier at any time.

To reset the TV Advertiser ID:

Menu > Admin & Privacy > Advertising > Reset TV Advertiser ID > OK

Ad Replacement

Replaces Standard Ads with Personalized Ads in Linear TV.

To turn Ad Replacement on or off:

Menu > Admin & Privacy > Advertising > Ad Replacement

- Use the **Left/Right Navigation** buttons to toggle from on or off

View VIZIO Privacy Policy

To view VIZIO Privacy Policy:

Menu > Admin & Privacy > VIZIO Privacy Policy > OK

Store Demo

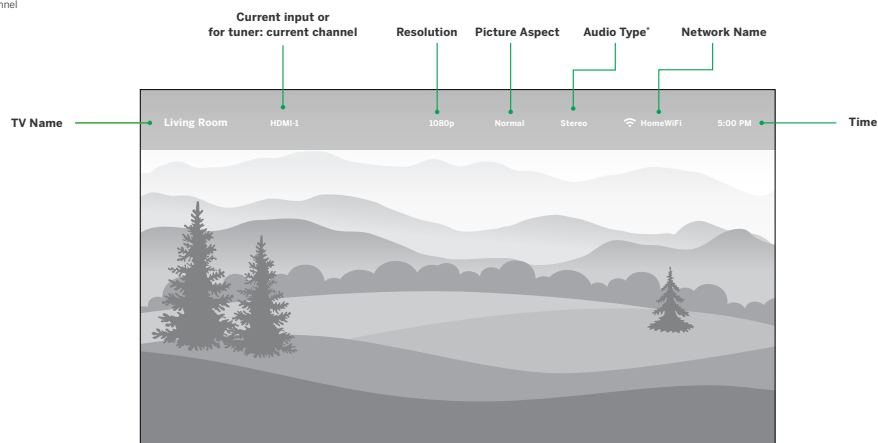
To set to Off, Demo 1, or Demo 2:


Menu > Admin & Privacy > Store Demo

USING THE INFO WINDOW

Press the **INFO** button to display:

- TV name
- Current input or for tuner: current channel
- Picture resolution
- Picture aspect
- Audio type
- Network name
- Time



*When TV speakers are off and Dolby Atmos content is passed through the TV to a sound bar or other audio device, the Dolby Atmos icon  will display with "Audio Out."


SmartCast Home™

What is SmartCast Home?

SmartCast Home lets you discover, stream, and control your content like never before! Access top apps, like Netflix, Disney+, and Hulu, by using the remote to easily browse and launch content directly from the home screen. SmartCast Home makes finding something to watch easy and fun.

How to Launch SmartCast Home

To begin streaming with SmartCast Home:

- Press the **SmartCast Home** button  on your remote.
- OR—
- Select **SmartCast** from the list of inputs.

What you can do with SmartCast Home

- Stream high quality entertainment.
- Launch top tier apps directly from the home screen.
- Access free channels to watch without a subscription through WatchFree+.
- Rearrange apps on your home screen just the way you like it.
- Mirror your laptop or mobile device onto your TV through Apple Airplay or Chromecast built-in*.



- Works with Google Assistant, Siri, and Alexa-enabled devices for hands-free voice control.

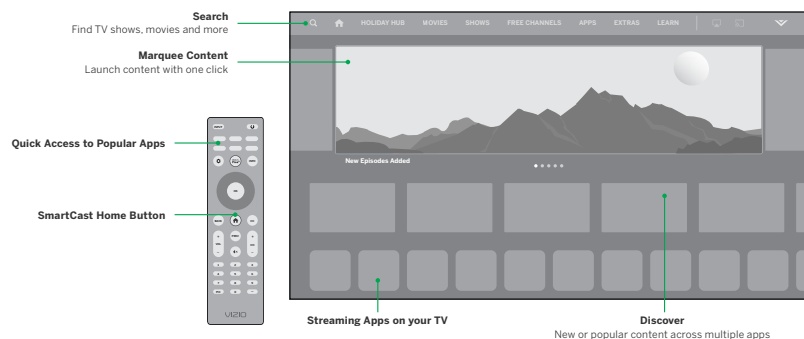


Control your TV with the SmartCast Mobile™ App

Download the VIZIO SmartCast Mobile app and turn your smartphone into a remote to control and configure your TV.

With SmartCast Mobile, you can:

- Power on/off devices, play/pause content, and modify advanced settings, all from the palm of your hand.
- Easily enter text onto your TV/display from your mobile device using a full keyboard.
- Browse and discover movies, TV shows, music, live streams, and more, across multiple apps at once.
- Access a quick look at show ratings, synopsis, cast, crew, clips, and other details.



Scan to download.
Scan with your phone camera or QR reader.

vizio.com/smartcastapp



Visit www.vizio.com/smartcastapp for minimum requirements.

WatchFree+™

4

What is WatchFree+?

VIZIO WatchFree+ takes your cord-cutting entertainment experience one step further! With the simple press of a button, enjoy free streaming TV with hundreds of live TV channels to choose from – news, movies, sports, comedy, music and more. A built-in on-screen guide makes finding something to watch easier than ever.

And it's all FREE—no fees, no subscriptions, or logins.

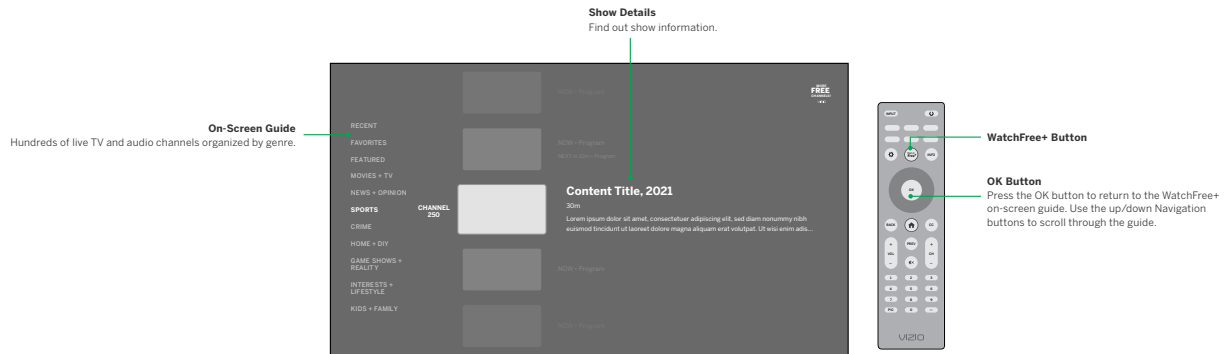
What you can do with WatchFree+

- Stream hundreds of live TV channels absolutely free – news, movies, sports, comedy, music and more.
- Navigate through channels, organized by genre, with an intuitive on-screen guide.
- Watch the best of internet TV.
- No logins, subscriptions or transactions fees.

How to Launch WatchFree+

To launch and begin watching entertainment offered on WatchFree+:

- Press the **WatchFree+** button on your remote.
- Select **WatchFree+** from the list of inputs or app row.

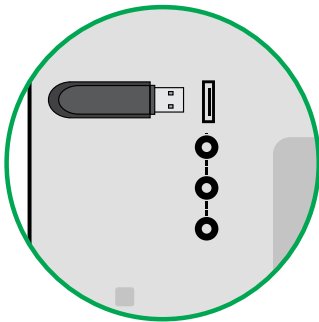


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Playing USB Media

4

The USB Media Player allows you to connect a USB flash drive to your TV and play music, video, or photos.



Preparing Your USB Drive to Play USB Media

To display USB media, you must first save your videos onto a USB flash drive:

- The USB flash drive must be formatted as FAT32.
- Files on the USB flash drive must end in a supported file extension (.mp3, .jpg, etc).
- The player is not designed to play media from external hard drives, MP3 players, cameras, or smartphones.

Displaying USB Media

To display your USB media:

1. Connect your USB drive to the USB port on the side of the TV.
2. The TV will recognize the USB. Use the **Navigation** Keys on the remote to select the content you want to play.
3. Select **USB** from the bottom streaming icons on the SmartCast Home™ page.

TIP: You can display your photos in Fullscreen. Select the photo, press **OK**, then highlight **Fullscreen** and press **OK**.

Removing the USB Drive from the TV

To safely remove your USB flash drive from the TV:

1. Turn the TV **off**.
2. Disconnect your USB flash drive from the USB port on the side of the TV.



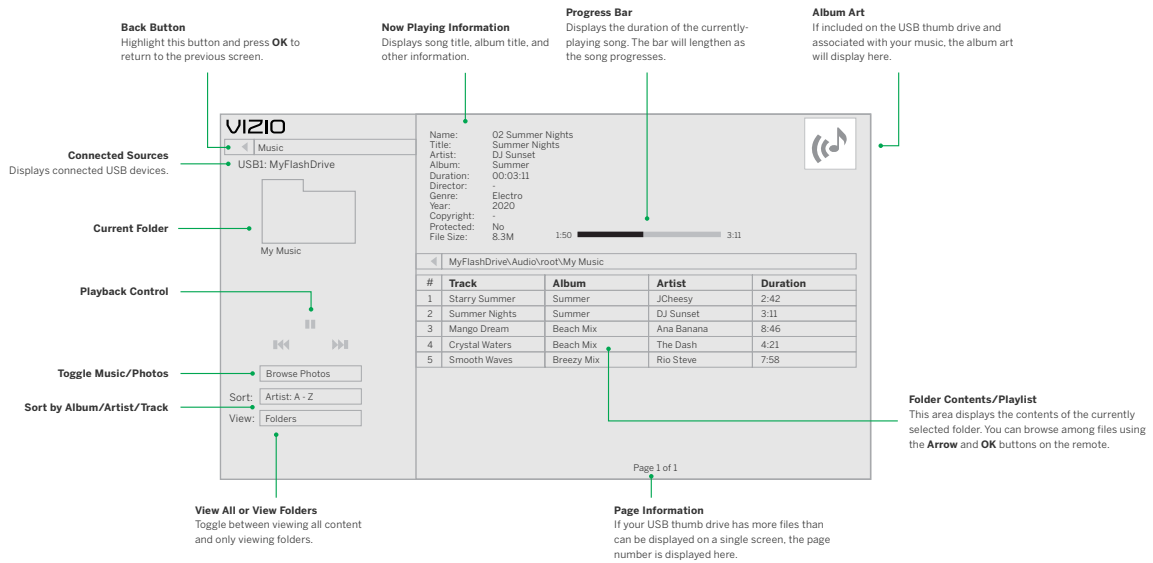
WARNING: Do not remove the USB drive while the TV is on. Doing so may damage the drive.

Note: The image shown here is for illustrative purposes only and may be subject to change. The actual number of ports and their locations may vary, depending on the model.

30

Playing USB Media: Music

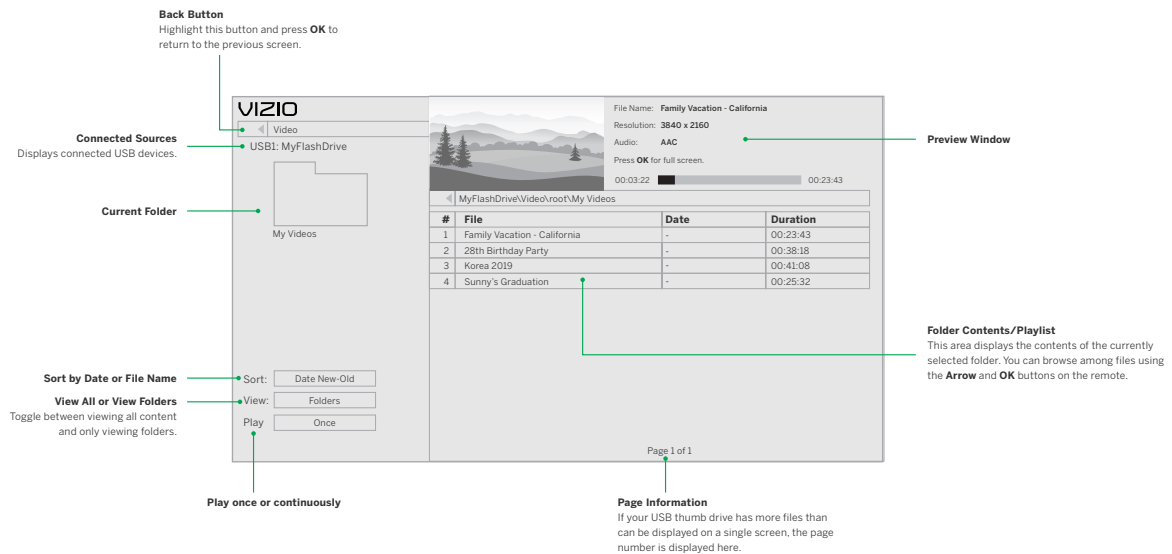
4



31

Playing USB Media: Video

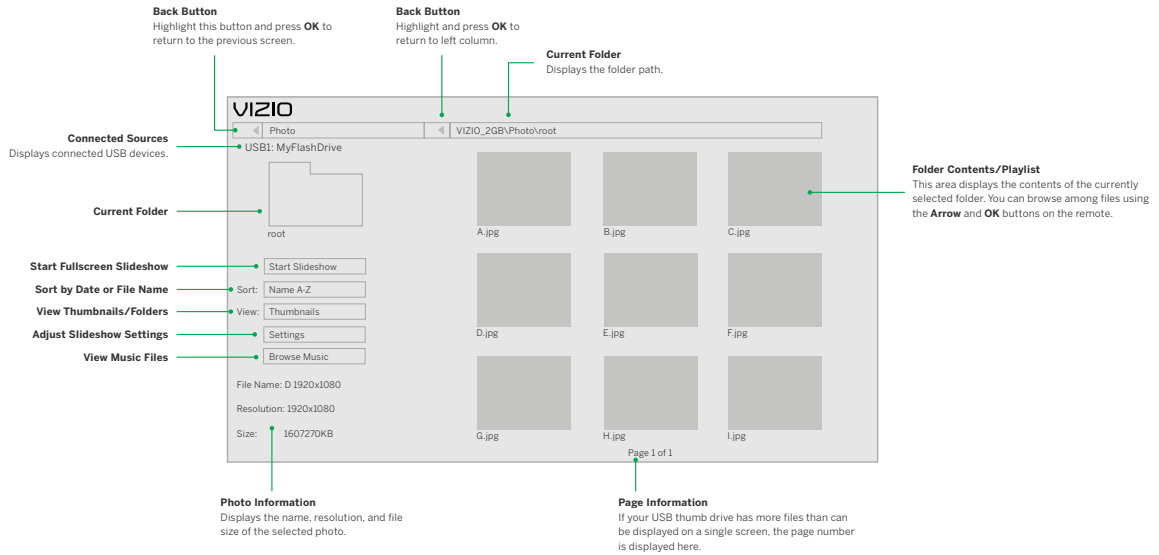
4



32

Playing USB Media: Photo

4



33

Product Registration and Support

A

Get helpful tips and register your TV.

Scan with your phone camera or QR reader.



Customized Support

Get live assistance quickly with your information on hand.



News and Offers

Take advantage of the latest news and special offers from VIZIO.



Updates and Enhancements

Stay up-to-date with important product updates and notifications.

More questions? Find answers at:

SUPPORT.VIZIO.COM

34

Help Topics

A

The remote is not responding.

- Make sure the batteries are properly inserted matching the - and + symbols.
- Replace the batteries with fresh ones.

The TV displays "No Signal."

- Press **INPUT** button on the remote control to select a different input source.
- If you are using cable TV or antenna connected directly to the TV, scan for channels. See *Scanning for TV Channels on page 16*.

There is no power.

- Ensure the TV is plugged into a working electrical outlet.
- Ensure the power cable is securely attached to the TV.
- Press the Power/Standby button on the remote or on the back of the TV to turn the TV on.

The power is on, but there is no image on the screen.

- Ensure all cables are securely attached to the TV.
- Ensure all devices are connected correctly. Devices differ; see your device's user manual for details.
- Adjust Brightness, Contrast, or Backlight. See *Adjusting the Picture Settings on page 8*.
- Press the **INPUT** button on the remote to select a different input source.

The sound is flat or dialog is not audible.

- Turn off Volume Leveling. See *Adjusting the Audio Settings on page 14*.

Where do I find information on the accessibility features of this product and other VIZIO products?

- Please visit vizio.com/accessibility.
- Email us at: Accessibility@vizio.com.
- Give us a call at 1-877-698-4746.

How do I stream apps like Netflix to my VIZIO SmartCast® TV?

- Popular apps are located on the SmartCast Home™ screen, so you can simply navigate to the app row on your SmartCast TV to start streaming.
- You can also use Apple AirPlay 2 or Chromecast built-in™ to stream content from your device directly to your SmartCast TV. For more information, please visit:
 - VIZIO.com/Apple
 - VIZIO.com/Google

The colors on the TV don't look right.

- Adjust the Color and Tint settings in the Picture menu. See *Adjusting the Picture Settings on page 8*.
- Select a pre-set picture mode. VIZIO recommends selecting Calibrated.
- Check all cables to ensure they are securely attached.

The image quality is not good.

- For the best image quality, view high-definition programs using digital sources. Connect your devices with HDMI cables.
- If you are using an antenna, the signal strength of the channel may be low. Ensure your antenna is connected securely to the TV and move the antenna around the room or close to a window for the best signal.

The picture is distorted.

- Move the TV away from electrical appliances, cars, and fluorescent lights.
- Ensure all cables are securely attached.

The TV image does not cover the entire screen.

- If you are using TV, AV, or Component with 480i input, go to Menu > Picture > Picture Aspect.

The TV has pixels (dots) that are always dark.

- Your HD TV is precision-manufactured using an extremely high level of technology. However, sometimes pixels may not display correctly. These types of occurrences are inherent to this type of product and do not constitute a defective product.

The buttons on the remote aren't working.

- Ensure you are only pressing one button at a time.
- Point the remote directly at the TV when pressing a button.
- Replace the remote batteries with new ones. See *Replacing the Batteries on page 5*.

There is no sound.

- Press Volume Up on the remote control.
- Press the **MUTE** button on the remote to ensure mute is off.
- Check the audio settings. See *Adjusting the Audio Settings on page 14*.
- Check the audio connections of external devices (Blu-ray player, game console, cable/satellite box) that are connected to the TV.
- If you are using an antenna, the signal strength of the channel may be low. Ensure your antenna is connected securely to the TV and move the antenna around the room or close to a window for the best signal.
- Set eARC to Off and use ARC mode.

35

Help Topics

A

I see "noise" or static on the screen.

- When your TV's digital capabilities exceed a digital broadcast signal, the signal is up-converted (improved) to match your TV's display capabilities. This up-converting can sometimes cause irregularities in the image.
- If you are using an antenna, the signal strength of the channel may be low. Ensure your antenna is connected securely to the TV and move the antenna around the room or close to a window for the best signal.

When I change input source, the TV image changes size.

- The TV remembers the viewing mode on each input source. If the viewing mode on the new input source differs from the one on the input source you switch from, the difference may be noticeable.
- See *Changing the Picture Aspect Ratio on page 9*.

How do I download the VIZIO SmartCast Mobile™ App?

- Make sure your phone or tablet is connected to a Wi-Fi network. Open a browser on your phone or tablet.
- Navigate to vizio.com/smartcastapp and follow the on-screen instructions to download the VIZIO SmartCast Mobile™ App.

How do I change the Inputs?

- Press the **INPUT** button on the back of the TV to cycle through the Inputs.
- Press the **INPUT** button on the basic remote to cycle through the Inputs.
- Make sure the VIZIO SmartCast Mobile™ app is installed on your phone or tablet. Open the VIZIO SmartCast Mobile app. Tap on the Device list and select your TV. Tap on the Input key and select the Input of your choice.

How do I connect to my Wi-Fi network?

- On your TV remote, press the **MENU** button then go to Network > Select your Wi-Fi name > Enter password.
- Open the VIZIO SmartCast Mobile™ app on your phone or tablet. Tap on the Menu Tab > SmartCast Devices > Your TV/Device Name > Network
- Tap on the Settings icon > Network > Wireless Access Points. Select your Wi-Fi network from the list, enter the Wi-Fi password, and tap Connect.

How do I exit Demo Mode?

- Press and hold the **INPUT** button on the back of the TV to exit the demo mode.

How do I watch Cable/Antenna TV channels?

- If you subscribe to cable or satellite, simply connect an HDMI cable (not included) to the receiver.
- If you use external antennas to watch local broadcast channels, use a coaxial cable to connect.

Some of my Channels are missing.

- Press the **MENU** button on your TV remote and select the channels option. Then select Find Channels.
- Open the VIZIO SmartCast Mobile app on your phone or tablet.
- **Click on:** Menu Tab > SmartCast Devices > Your TV/Device Name > Channels > Find Channels.

How do I disable/enable Viewing Data?

- Press the **MENU** button on your remote and select ADMIN & PRIVACY. Then select Viewing Data to turn the feature on or off.

The television will not turn on using Alexa or Google Assistant.

- Ensure the television is in Quick Start Mode.
- Tap on Menu > System > Power Mode > Quick Start.

How do I know I am getting 4K resolution or HDR content such as Dolby Vision?

- As you are watching content on the television, press the **INFO** button on the remote or VIZIO SmartCast Mobile app. You will see the current resolution being displayed along with the version of video.
- HDR will show as a Dolby Vision icon, HDR10 or HLG.

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Specifications

B

	D24h-J09	D24f-J09	D32h-J09	D32f-J04	D40f-J09	D43f-J04
Size	24"	24"	32"	32"	40"	43"
Viewable Area	23.5"	23.5"	31.5"	31.5"	39.5"	42.5"
PRODUCT DIMENSIONS						
Dimensions w/ Stand	21.82" x 14.85" x 6.21" (554.3 x 377.3 x 157.8 mm)	21.82" x 14.85" x 6.21" (554.3 x 377.3 x 157.8 mm)	28.88" x 19.49" x 7.04" (733.5 x 495.1 x 178.7 mm)	28.59" x 19.02" x 4.66" (726.28 x 483.2 x 118.3 mm)	35.55" x 22.81" x 8.81" (903.1 x 579.3 x 223.8 mm)	38.1" x 24.47" x 9.37" (968.3 x 621.5 x 237.9 mm)
Dimensions w/o Stand	21.82" x 13.28" x 2.34" (554.3 x 337.3 x 59.4 mm)	21.82" x 13.28" x 2.34" (554.3 x 337.3 x 59.4 mm)	28.88" x 17.21" x 2.78" (733.5 x 437.1 x 70.5 mm)	28.59" x 16.76" x 3.06" (726.28 x 425.7 x 77.62 mm)	35.55" x 20.45" x 2.54" (903.1 x 519.3 x 64.6 mm)	38.1" x 22.11" x 2.697" (968.3 x 561.5 x 68.5 mm)
Weight w/ Stand	6.07 lb (2.75 kg)	6.07 lb (2.75 kg)	8.71 lb (3.95 kg)	8.99 lb (4.08 kg)	12.35 lb (5.6 kg)	14.4 lb (6.53 kg)
Weight w/o Stand	6 lb (2.72kg)	6 lb (2.72kg)	8.62 lb (3.91 kg)	8.86 lb (4.02 kg)	12.17 lb (5.5 kg)	14.22 lb (6.45 kg)
Mounting Screw Size	M4	M4	M4	M4	M6	M4
Hole Pattern	100 mm x 100 mm	100 mm x 100 mm	100 mm x 100 mm	100 mm x 100 mm	200 mm x 100 mm	200 mm x 100 mm
# of Screws (not included)	4	4	4	4	4	4
PICTURE QUALITY						
Maximum Resolution	1366 x 768 (HD)	1920 x 1080 (FHD)	1366 x 768 (HD)	1920 x 1080 (FHD)	1920 x 1080 (FHD)	1920 x 1080 (FHD)
LCD Backlight	EdgeLit LED	Full Array LED	Full Array LED	Full Array LED	Full Array LED	Full Array LED
Refresh Rate	60 Hz	60 Hz	60 Hz	60 Hz	60 Hz	60 Hz
INPUTS / OUTPUTS						
HDMI Inputs	2	2	2	2	2	2
Composite Video Inputs	1	1	1	1	1	1
Ethernet Input	0	0	0	0	0	0
RF Antenna Input	1	1	1	1	1	1
USB	1	1	1	1	1	1
Audio Output	HDMI ARC, Analog Stereo Output (3.5 mm)	HDMI ARC, Analog Stereo Output (3.5 mm)	HDMI ARC, Analog Stereo Output (3.5 mm), Digital Optical	HDMI ARC, Digital Optical	HDMI ARC, Analog Stereo Output (3.5 mm), Digital Optical	HDMI ARC, RCA, Digital Optical
OTHER						
Remote Control	IR Remote	IR Remote	IR Remote	IR Remote	IR Remote	IR Remote
Power Consumption	41 W	43 W	52 W	55 W	54 W	75 W
Standby Power	<0.5W	<0.5W	<0.5W	<0.5W	<0.5W	<0.5W
Voltage	120V	120V	120V	120V	120V	120V
OSD Language	English, French, Spanish	English, French, Spanish	English, French, Spanish	English, French, Spanish	English, French, Spanish	English, French, Spanish
Certification	UL, cUL, FCC Class B, IC, HDMI (CEC, ARC), Dolby Audio	UL, cUL, FCC Class B, IC, HDMI (CEC, ARC), Dolby Audio	UL, cUL, FCC Class B, IC, HDMI (CEC, ARC), Dolby Audio	UL, cUL, FCC Class B, IC, HDMI (CEC, ARC), Dolby Audio	UL, cUL, FCC Class B, IC, HDMI (CEC, ARC), Dolby Audio	UL, cUL, FCC Class B, IC, HDMI (CEC, ARC), Dolby Audio

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Regulatory Information

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FCC Class B Radio Interference Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Notice

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Shielded interface cables and AC power cord, if any, must be used in order to comply with the emission limits.

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modification to this equipment. It is the responsibilities of the user to correct such interference.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Operations in the 5GHz products are restricted to indoor usage only.

This equipment complies with FCC/ISED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Canada Notice for License-Exempt Radio Apparatus

This device complies with Industry Canada's license-exempt RSSs. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This device operates on a no-protection no-interference basis. Should the user seek to obtain protection from other radio services operating in the same TV bands, a radio license is required. Please consult Industry Canada's document CPC-2-1-28, Optional Licensing for Low-Power Radio Apparatus in the TV Bands, for details.

Cet appareil est conforme aux CNR exempts de licence d'Industrie Canada. Son fonctionnement est sujet aux deux conditions suivantes:

1. le dispositif ne doit pas produire de brouillage préjudiciable, et
2. ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable

Cet appareil fonctionne sur une base sans protection et sans interférence. Dans le cas où l'utilisateur cherche à obtenir de la protection des autres services de radio fonctionnant sur les mêmes bandes TV, aucune licence est requise. Veuillez consulter le document CPC-2-1-28 d'Industrie Canada. License optionnelle pour les appareils radio de faible puissance, pour plus de détails.

Industry Canada Class B emission compliance statement

This Class B digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

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Limited Warranty

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UNITED STATES AND CANADA

By using this VIZIO product, you accept all VIZIO Terms and Conditions, including all the Terms of Warranty, BINDING ARBITRATION AGREEMENT (for U.S. Residents Only), and Class Action Waiver. If you do not agree to the terms of this warranty, do not use the VIZIO product and, within thirty (30) days of the date of purchase, return it for a refund to the authorized retailer where you purchased it. If you live in the U.S., you have the right to opt out of the Arbitration Agreement and Class Action Waiver within 60 calendar days of your purchase. Please refer to the full section "Binding Arbitration Agreement; Class Action Waiver" below for more details and instructions for opt-out. Full Terms and Conditions may be viewed at vizio.com/en/terms/terms-of-service.

How Long This Warranty Lasts

For non-commercial use, VIZIO warrants the product on the terms set forth below for one (1) year from the date of original purchase. For commercial use, VIZIO warrants this product on the terms set forth below for ninety (90) days from the date of original purchase.

What This Warranty Covers

VIZIO warrants the product against defects in materials and workmanship when the product is used normally in accordance with VIZIO's user guides and manuals. Except where restricted by law, this warranty applies only to the original purchaser of a new product. The purchase must have been made from an authorized retailer in the United States (including Puerto Rico) or Canada. The product must also be located in the country where it was purchased at the time of warranty service.

Zero Bright Pixel Defect Guarantee (Displays Only)

Your product may qualify for a warranty against "zero bright pixel" defects for the duration of the warranty on select new product purchases. To determine if this guarantee applies to your product, refer to the model's product information page at www.vizio.com, look for the "zero bright pixel" guarantee on the box, or contact VIZIO Technical Support at the email address or telephone number below.

How to Get Service

Before obtaining warranty service, you may visit www.vizio.com for additional help and troubleshooting. To obtain warranty service, contact VIZIO Customer Support by going to support.vizio.com and selecting **Contact Us**.

Your Obligations Before Service

You must obtain pre-authorization before sending your product to a VIZIO service center. You may be required to supply a purchase receipt (or copy) to show that the product is within the warranty period. When you return a product to a VIZIO service center, you must ship the product in its original packaging or in packaging that affords an equal degree of protection. VIZIO Technical Support will provide instructions for packing and shipping the product to the VIZIO service center. ALL USER DATA AND DOWNLOADED APPLICATIONS STORED ON A PRODUCT WILL BE DELETED IN THE COURSE OF SOME IN-HOME AND ALL SHIP-IN WARRANTY SERVICE. If this occurs, your product will be restored to its original state. You will be responsible for restoring all applicable user data and downloaded applications. Recovery and reinstallation of user data and downloaded applications is not covered under this warranty. In order to protect your personal information, VIZIO recommends that you always clear all personal information from the product before it is serviced, regardless of the service.

VIZIO's Responsibilities

If VIZIO determines that a product is covered by this warranty, VIZIO will (at its option) repair or replace it, or refund the purchase price to you. There will be no charge for parts or labor during the warranty period. Replacement parts may be new or recertified at VIZIO's option and sole discretion. Replacement parts and VIZIO's labor are warranted for the remaining portion of the original warranty or for ninety (90) days from warranty service, whichever is longer.

Types of Service

TVs that are 32 inches or larger will usually be serviced in-home. In-home service requires complete and easy access to the product and does not include de-installation or re-installation of the product. In-home service is subject to availability. VIZIO will provide other service options when in-home service is not available. All other VIZIO products must be sent to a VIZIO service center to obtain warranty service. VIZIO is not responsible for transportation costs to the service center, but VIZIO will cover return shipping to the customer.

What This Warranty Does Not Cover

This warranty does not cover: (a) cosmetic damage; (b) normal wear and tear; (c) improper operation; (d) improper voltage supply or power surges; (e) signal issues; (f) damage from shipping; (g) acts of God; (h) customer misuse, modifications or adjustments; (i) installation, set-up, or repairs attempted by anyone other than by a VIZIO authorized service center; (j) products with unreadable or removed serial numbers; (k) products requiring routine maintenance; or (l) products sold "AS IS," "CLEARANCE," "FACTORY RECERTIFIED," or by a non-authorized reseller.

What to Do If You Are Not Satisfied With Service

If you feel VIZIO has not met its obligations under this warranty, you may attempt to resolve the issue informally with VIZIO. If you are unable to resolve the issue informally and wish to file a formal claim against VIZIO, and if you are a resident of the United States, you must submit your claim to binding arbitration according to the procedures described below, unless an exception applies. Submitting a claim to binding arbitration means that you do not have the right to have your claim heard by a judge or jury. Instead your claim will be heard by a neutral arbitrator.

Binding Arbitration Agreement; Class Action Waiver (U.S. Residents Only)

UNLESS YOU HAVE BROUGHT AN ELIGIBLE CLAIM IN SMALL CLAIMS COURT OR HAVE OPTED OUT AS DESCRIBED BELOW, ANY CONTROVERSY OR CLAIM RELATING IN ANY WAY TO YOUR VIZIO PRODUCT, INCLUDING ANY CONTROVERSY OR CLAIM ARISING OUT OF OR RELATING TO THIS WARRANTY, A BREACH OF THIS WARRANTY, OR THE VIZIO PRODUCT'S SALE, CONDITION OR PERFORMANCE, WILL BE SETTLED BY BINDING ARBITRATION ADMINISTERED BY THE AMERICAN ARBITRATION ASSOCIATION AND CONDUCTED BY A SINGLE ARBITRATOR APPOINTED BY THE AMERICAN ARBITRATION ASSOCIATION, IN ACCORDANCE WITH ITS COMMERCIAL ARBITRATION RULES AND ITS SUPPLEMENTARY PROCEDURES FOR CONSUMER-RELATED DISPUTES. You may learn more about the American Arbitration Association and its rules for arbitration by visiting www.adr.org or by calling 800-778-7879. Since this warranty concerns a transaction in interstate or international commerce, the Federal Arbitration Act will apply.

The filing fees to begin and carry out arbitration will be shared between you and VIZIO, but in no event will your fees ever exceed the amount allowable by the American Arbitration Association, at which point VIZIO will cover all additional administrative fees and expenses. VIZIO waives its right to recover attorneys' fees in connection with any arbitration under this warranty. If you are the prevailing party in an arbitration to which the Supplementary Procedures for Consumer-Related Disputes applies, then you are entitled to recover attorneys' fees as the arbitrator may determine.

The dispute will be governed by the laws of the state or territory in which you resided at the time of your purchase (if in the United States). The place of arbitration will be Irvine, California, or your county of residence (if in the United States). The arbitrator will have no authority to award punitive or other damages not measured by the prevailing party's actual damages, except as may be required by statute. The arbitrator will not award consequential damages, and any award will be limited to monetary damages and will include no equitable relief, injunction, or direction to any party other than the direction

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to pay a monetary amount. Judgment on the award rendered by the arbitrator will be binding and final, except for any right of appeal provided by the Federal Arbitration Act, and may be entered in any court having jurisdiction. Except as may be required by law, neither you nor VIZIO nor an arbitrator may disclose the existence, content, or results of any arbitration under this warranty without the prior written consent of you and VIZIO.

ANY DISPUTE, WHETHER IN ARBITRATION, IN COURT, OR OTHERWISE, WILL BE CONDUCTED SOLELY ON AN INDIVIDUAL BASIS. VIZIO AND YOU AGREE THAT NO PARTY WILL HAVE THE RIGHT OR AUTHORITY FOR ANY DISPUTE TO BE ARBITRATED AS A CLASS ACTION, A PRIVATE ATTORNEY GENERAL ACTION, OR IN ANY OTHER PROCEEDING IN WHICH EITHER PARTY ACTS OR PROPOSES TO ACT IN A REPRESENTATIVE CAPACITY. NO ARBITRATION OR PROCEEDING WILL BE JOINED, CONSOLIDATED, OR COMBINED WITH ANOTHER ARBITRATION OR PROCEEDING WITHOUT THE PRIOR WRITTEN CONSENT OF ALL PARTIES TO ANY SUCH ARBITRATION OR PROCEEDING.

Opt-Out Instructions

IF YOU DO NOT WISH TO BE BOUND BY THE BINDING ARBITRATION AGREEMENT AND CLASS ACTION WAIVER, THEN: (1) you must notify VIZIO in writing within sixty (60) days of the date that you purchased the product; (2) your written notification must be mailed to VIZIO at 39 Tesla, Irvine, CA 92618, Attn: Legal Department; and (3) your written notification must include (a) your name, (b) your address, (c) the date you purchased the product, and (d) a clear statement that you wish to opt out of the binding arbitration agreement and class action waiver.

In addition, you may pursue a claim in small claims court in your county of residence (if in the United States) or in Orange County, California. In such case the provisions of the section titled "Binding Arbitration Agreement; Class Action Waiver (U.S. Residents)" will not apply.

Exclusions and Limitations

TO THE GREATEST EXTENT PERMITTED BY APPLICABLE LAW, THERE ARE NO EXPRESS WARRANTIES OTHER THAN THOSE DESCRIBED ABOVE. ANY IMPLIED WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WILL BE LIMITED IN DURATION TO THE WARRANTY PERIOD SET FORTH ABOVE. SOME STATES AND PROVINCES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS. SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

VIZIO WILL NOT BE RESPONSIBLE FOR LOSS OF USE, LOSS OF INFORMATION OR DATA, COMMERCIAL LOSS, LOST REVENUE OR LOST PROFITS, OR OTHER INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, EVEN IF

VIZIO HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, AND EVEN IF THE REMEDY FAILS OF ITS ESSENTIAL PURPOSE. SOME STATES AND PROVINCES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

IN LIEU OF ANY OTHER REMEDY FOR ANY AND ALL LOSSES AND DAMAGES RESULTING FROM ANY CAUSE WHATSOEVER (INCLUDING VIZIO'S NEGLIGENCE, ALLEGED DAMAGE, OR DEFECTIVE GOODS, NO MATTER WHETHER SUCH DEFECTS ARE DISCOVERABLE OR LATENT), VIZIO MAY, AT ITS SOLE AND EXCLUSIVE OPTION AND IN ITS DISCRETION, REPAIR OR REPLACE YOUR PRODUCT, OR REFUND ITS PURCHASE PRICE. AS NOTED, SOME STATES AND PROVINCES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

How the Law Applies

This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state and province to province. This warranty applies to the greatest extent permitted by applicable law.

General

No employee or agent of VIZIO may modify this warranty. If any term of this warranty, other than the class action waiver, is found to be unenforceable, that term will be severed from this warranty and all other terms will remain in effect. If the class action waiver is found to be unenforceable, then the entire section titled "Binding Arbitration Agreement; Class Action Waiver (U.S. Residents Only)" will not apply. This warranty applies to the maximum extent not prohibited by law.

Changes to Warranty

This warranty may change without notice, but any change will not affect your original warranty. Check www.vizio.com for the most current version.

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Legal Information

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Software Licenses

All software is provided subject to a software license agreement(s) and you agree that you will be bound by such license agreement(s) in addition to these terms. Your use of this product is subject to VIZIO's privacy policy, which may be updated from time to time, and is available to view at vizio.com/privacy.

Export Regulations

Customer acknowledges that the VIZIO products, which include technology and software, are subject to customs and export control laws in the United States ("US"). The products may also be subject to the customs and export control laws and regulations of the country in which the products are manufactured and/or received.

Internet Connectivity and App Availability

Network conditions, environmental and other factors may negatively affect connectivity and the resulting video quality, if any. The applications and content of the applications pictured herein or described in accompanying documentation may only be available in certain countries or languages, may require additional fees or subscription charges, and may be subject to future updates, modifications or discontinuation without notice. VIZIO has no control over third party applications or content and assumes no responsibility for the availability or interruption of such applications or content. Additional third party terms, conditions and restrictions apply.

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App services featured on the included IR remote may vary and may not be available in all regions.

4K or HDR availability varies by app and may be subject to subscription fees, internet service, and device capabilities.

Battery Disposal

Caution: This product may be shipped with batteries. Do not dispose of batteries in a fire or with ordinary household waste. Batteries may explode and can cause damage. Replace batteries only with the same or equivalent type of battery recommended by VIZIO. The disposal of batteries may be regulated by your state. For more information on recycling or properly disposing of your batteries, please check with your state or go to vizio.com/environment.



Product Recycling

The disposal and recycling of consumer electronic products may be regulated by your state. Always properly dispose of your VIZIO products in accordance with local laws and regulations. VIZIO supports the proper recycling of our products. For information on how to properly recycle your VIZIO products and to learn more about consumer electronics recycling laws, please go to vizio.com/environment or call (800) 374-3473.

Packaging Disposal

VIZIO encourages the recycling of the packaging used for this product. Please break-down all boxes and recycle eligible materials according to local laws and regulations. For more information please go to vizio.com/environment or call (800) 374-3473.

Accessibility

For information on the accessibility features of this product and other VIZIO products please visit:

Website: vizio.com/accessibility

Email: Accessibility@vizio.com

Phone: 1-877-698-4746

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210329SL



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